

**INFORMATION TECHNOLOGIES, TELECOMMUNICATIONS
AND E-COMMERCE MARKET OPPORTUNITIES
FOR U.S. SMALL AND
MEDIUM-SIZED BUSINESSES**

ExportIT Japan

**U.S. DEPARTMENT OF COMMERCE
International Trade Administration
Trade Development
Information Technology Industries**



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FOREWORD

This report describes and analyzes the trends, key issues, and events in information technology, telecommunications, Internet and e-commerce adoption in Japan, to create a framework from which U.S. small- and medium-sized enterprises (SMEs) can make educated business decisions about entering these markets. The report analyzes the status of telecommunications liberalization, competition in telecommunications services, the deployment of new technologies, and how these changes are affecting the adoption of the Internet and e-commerce. It also analyzes economic, cultural, and political factors influencing the adoption of information, Internet and e-commerce technologies. The report highlights market opportunities relevant to U.S. SMEs in the telecommunications, information technology (IT), semiconductor and e-commerce areas. And the report provides suggested market entry strategies for SMEs, U.S. Department of Commerce and other resources to assist U.S. firms in market entry endeavors, and contacts in the United States and Japan.

The report is based on market research and analysis undertaken in Japan in February 2002 by international trade specialists from the Information Technology Industries unit of Trade Development within the Commerce Department's International Trade Administration (ITA): Richard Paddock with the Office of Telecommunications Technologies and James Golsen with the Office of Information Technologies. They interviewed software, Internet and telecommunications equipment and services producers, trade associations, industry analysts, and government officials in Tokyo, Japan. The work was actively supported by market specialists in ITA's Commercial Service (US&FCS) in Japan. Information gathered from on-site interviews was supplemented with data from market research firms and a review of available literature.

Robert Blankenbaker and Chirstina Sajous of the Office of Microelectronics, Medical Equipment and Instrumentation contributed information on the semiconductor industry in Japan.

EXECUTIVE SUMMARY

This report is part of the International Trade Administration's *ExportIT Market Research* series designed to provide U.S. small- and medium-sized enterprises (SMEs) in the telecommunications, information technology (IT) and e-commerce sectors with timely, affordable information. The report will provide an overview of the Japanese market for these products and services. It will also provide a framework by which to judge the potential for conducting business in a country that is a major U.S. trading partner and in which the Japanese government and the private sector have realized the critical nature of telecommunications and IT to economic growth and global competitiveness.¹ The uptake of these technologies is and will continue to be rapid and as broadly based as investment funds and personal income will allow.

Despite the prolonged downturn in the Japanese economy, information technology and wireless communications continue to provide attractive market opportunities for firms willing to invest time and resources in the world's second largest information technology market².

Japan's telecommunications sector, which has generally outperformed the overall economy, has experienced a remarkable period of activity and change over the past few years. Recent Japanese regulatory changes, including the introduction of domestic and international resale, Internet

telephony, cable telephony, and the elimination of foreign investment restrictions in facility-based carriers, have resulted in significant new opportunities. While Nippon Telegraph and Telephone (NTT) remains dominant in services, new carriers are gaining market share - more than 300 new facility-based telecommunications service providers, commonly called "new common carriers" (NCCs), are now operating in Japan in competition with NTT. The nature of telecom traffic in Japan is shifting from traditional wireline services toward broadband and wireless services. With the encouragement of the Japanese government, carriers are accelerating the build-out of fiber networks, and wireless operators are moving rapidly toward next generation services.

Fiber optics have received a significant boost from Japan's declared goals of rapidly expanding fiber-to-the-home (FTTH). Although ISDN has proved disappointing, the number of digital subscriber lines (DSL) to homes presently exceeds 2.5 million, and is projected to pass the 9 million mark by 2003. Wireless is another especially vibrant industry within the telecom sector. Wireless subscribership exceeded 70 million at the end of 2001, and the Ministry of Public Management, Home Affairs, Post and Telecommunications (MPHPT) predicts that by 2005, more than 80 million Japanese, about three fifths of the population, will subscribe to some form of mobile service. Japan's grand experiment with always-on wireless Internet access, DoCoMo's i-Mode, has been remarkably successful, and Japan's wireless operators have high hopes for recently introduced third generation wireless services.

Japan is unique in that 70 percent of Internet

¹ A list of meetings attended by USD OC staff in Tokyo follows this report. Many of the conclusions drawn in the report are based on the collective information gathered by USD OC personnel in Tokyo.

² Source: USD OC and IDC

users can access the net via wireless communications devices. This is expected to change as the Japanese government pushes for broadband access to 80 percent of Japanese households by 2005³. Broadband access, via ADSL or cable modem, presently lags behind that of a number of other Asian countries but is now increasing at a dramatic rate. Due to competition and deregulation, ADSL service is now as cheap as, if not cheaper than, dial-up Internet access in Japan. The numbers of subscribers to ADSL jumped from 71,000 in 2000 to 1,850,000 by the end of 2001. This number is expected to more than double by 2003. Approximately 1.5 million Japan households have the option to access communication services via cable, with more than 12 million choosing to subscribe to fixed wireless access (FWA).

The value of B2C goods sold online in Japan is estimated to be \$13 billion and is expected to grow to \$98 billion by 2005. Most major Japanese retailers have highly developed B2C strategies. B2C e-commerce should grow in tandem with home broadband Internet access. Currently, the real estate and automobile industries account for 46 percent of the total B2C market in Japan. Other industry sectors, including travel, finance, food, gifts and entertainment are expected to narrow the gap in the coming years.

Opportunities in B2B are growing quickly. Most medium- to large-sized Japanese companies are currently looking at B2B as one way to cut costs, reduce inventories, and streamline operations. The continuing overall downturn in the Japanese economy has provided a market opportunity for ERP, CRM, and supply chain management

suppliers. The Japanese B2B market is currently valued at \$151 billion and is expected to increase to \$870 billion by 2005. The B2B market in Japan is dominated by the electronics and automobile industries which together account for 90 percent of the total B2B market.

The Japanese software market is dominated by American imports. Of the total imported packaged software market in Japan, 91 percent originates in the United States. The customized software market in Japan accounts for 45 percent of the total software market. Japanese industry requires software producers to conform to their existing business models. As a result, customized software makes up a greater share of the market than in most other countries. Japan does not have a large domestic software industry and imports make up almost 50 percent of the total market. As Japanese companies continue to streamline their business processes and look for ways to cut costs they are expected to continue to seek out American software providers.

The Japanese Government is actively promoting IT and e-commerce in Japan. Responding to the general perception that Japan was falling behind other industrialized countries in the IT field, the Japanese Government launched an IT Strategy in 2001 with the goal of becoming the world's most advanced IT nation by 2005. The main elements of this plan include development of the world's most advanced Internet network, facilitation of e-commerce, digitization of government, promotion of e-education and ensuring the highest network security and reliability in the world.

Over the last several years, the Japanese Government has begun to move forward with initiatives and reforms necessary to develop and strengthen the legal framework for e-

³MPHTP Report 2001
<http://www.soum.u.go.jp/english/index.htm>

commerce including a revision of laws, rules and regulations in the area of electronic signatures, privacy, intellectual property, network security and SPAM control. Additionally, the private sector has been involved in developing initiatives for consumer protection and domain name registration. The U.S. Government welcomes the Japanese Government's efforts to improve the legal environment for electronic commerce, but notes that Japan needs to make more progress in a number of the aforementioned areas, including privacy, intellectual property rights and electronic signatures.

FY02.

Since the early 1990s, U.S. semiconductor firms had a major presence in the Japanese market the second largest in the world. U.S. firms have advanced as result of cutting-edge technology, increased globalization and government actions. The three U.S.-Japan Semiconductor Agreements represented a major achievement for U.S. trade policy. Although forecasts are upbeat, the Japanese market is expected to grow at a rate slightly less favorable than the other semiconductor regions.

Japan is also an important market for U.S. exports of semiconductor manufacturing equipment. Historically, Japan has been the largest export market for U.S. firms. However, in 2001, Japan fell to second place behind Taiwan.

In the future, capital expenditures by Japanese semiconductor firms are forecasted to lag behind those from other regions. Japanese semiconductor firms were devastated by the collapse of prices for dynamic random access memory (DRAM) and downturn in the IT Sector. As a result Japanese semiconductor manufacturers plan to be conservative with spending plans for

TERMS & ABBREVIATIONS

\$	Unless otherwise noted, dollar figures cited in the report are U.S. dollars
2G	second generation
3G	third generation
ADSL	asynchronous digital subscriber line
APEC	Asia Pacific Economic Cooperation
ARPL	average revenue per line
ARPS	average revenue per subscriber
ARPU	average revenue per unit
ASPs	application service providers
B2B	business-to-business
B2C	business-to-consumer
B2G	business-to-government
BTA	Agreement on Basic Telecommunications Services
CAGR	compound average growth rate
CAP	competitive access providers
CDPD	cellular digital packet data
CDMA	code division multiple access
CLEC	competitive local exchange carrier
CM	contract manufacturer
COD	cash on delivery
CPP	calling party pays
CRM	customer relationship management
DECT	digital enhanced cordless telecommunications
DLD	domestic long distance
EDI	electronic data interchange
ERP	enterprise resource planning
FCC	Federal Communications Commission
FDI	foreign direct investment
FMC	fixed/mobile convergence
FWA	fixed wireless access

GATS	General Agreement on Trade in Services
Ghz	billion cycles per second
GPRS	general packet radio service
GPS	global positioning system
GSM	global system of mobile communications
GOJ	government of Japan
HDSL	high bit rate digital subscriber line
ILD	international long distance
ICT	information and communications technologies
IDC	International Data Corporation
IDEN	Integrated Digital Enhanced Network
IFACs	Industry Functional Committees on Trade Policy Matters
ISA	industry sector analysis
ISDN	integrated services, digital network
ISACs	Industry Sector Advisory Committees
ISP	Internet service providers
IT	information technology
ITA	Information Technology Agreement
ITA	International Trade Administration
ITU	International Telecommunications Union
LMDS	local multipoint distribution system
MEP	minimum estimated prices
METI	Ministry of Economy, Trade and Industry
MEXT	Ministry of Education, Culture, Sports, Science and Technology
MFN	Most Favored Nation
MMDS	multipoint multichannel distribution system
MOFA	Ministry of Foreign Affairs
MPMHAPST	Ministry of Public Management, Home Affairs, Postal Services and Telecommunications
MSO	multi-service operator
MOU	minutes of use
NTDB	National Trade Data Bank
NTT	Nippon Telegraph and Telephone
OECD	Organization for Economic Cooperation and Development
OETCA	Office of Export Trading Company Affairs
PDA	personal digital assistant
PPP	public-private partnership
PC	personal computer
SMR	special mobile radio

SME	small and medium-sized enterprise
SMS	short message service
UMTS	universal mobile telecommunications system
USEAC	U.S. Export Assistance Centers
USTR	Office of the U.S. Trade Representative
VAS	value added services
VOIP	voice over Internet protocol
VSAT	very small aperture terminal
WAP	wireless application protocol
WLL	wireless local loop
WTO	World Trade Organization
Y2K	Year 2000

Glossary

Access server: A server with the ability to store data in, to retrieve data from, to communicate with, or to make use of any resource within a system.

Circuit switching: 1. A method of routing traffic through a switching center, from local users or from other switching centers, whereby a connection is established between the calling and called stations until the connection is released by the called or calling station. 2. A process that, on demand, connects two or more data terminal equipments (DTEs) and permits the exclusive use of a data circuit between them until the connection is released.

Data network: A configuration of telecommunication facilities for the purpose of transmitting data, as opposed to analog signals.

Exchange: A room or building equipped so that telephone lines terminating there may be interconnected as required. Equipment may include manual or automatic switching equipment.

Internet Service Provider (ISP): A company that provides access to the Internet for a monthly fee. ISPs give users a software package, username, password and access phone number. Equipped with a modem, you can then log on to the Internet and browse the World Wide Web and USENET, and send and receive e-mail.

Internet Telephony: A category of hardware and software that enables people to use the Internet as the transmission medium for telephone calls.

LAN: Acronym for local area network, a data communications system that (a) lies within a limited spatial area, (b) has a specific user group, (c) has a specific topology, and (d) is not a public switched telecommunications network, but may be connected to one.

Node: In network topology, a terminal of any branch of a network or an interconnection common to two or more branches of a network. Synonymous with junction point.

Router: In data communications, a functional unit used to interconnect two or more networks.

WAN: Acronym for wide area network. A network that provides data communications to a larger number of independent users than are usually served by a local area network (LAN) and is usually spread over a larger geographic area than that of a LAN.

CHAPTER 1: OVERVIEW OF THE JAPANESE TELECOMMUNICATIONS, INFORMATION TECHNOLOGY AND E-COMMERCE MARKETS

THE JAPANESE ECONOMIC ENVIRONMENT

Summary

Japan's information technologies (IT) markets have been adversely affected in recent years by the weak performance of the overall economy. Japan's real Gross Domestic Product (GDP) grew at an annual rate of just 1% over the past 10 years (1991-2001), the weakest performance of any of the major industrial economies, after growing at more than a 4% annual rate in the previous decade. The disappointing economic performance of the last few years is due in part to a weak financial sector. Data from Japanese banks indicate that 9% of all loans are non-performing, and private sector analysts believe actual bad loans are even larger. The weak economy has contributed to steady declines in the overall price level, with the consumer price level falling in each of the last three years and so far in 2002.

To achieve stronger growth in the years ahead, Japan needs to take action to address its banking sector problems and the related weaknesses in its corporate sector, to end deflation, and to open its economy through deregulation and structural reform

Political Climate

Japanese policy makers are currently faced with a myriad of tough choices.

Prime Minister Junichiro Koizumi came into office promising to clean up the banks, restrain government borrowing and impose structural reform. His fresh political style and his promises to try painful remedies for the sake of future gain gave him initial popular support with the recession weary Japanese. While the administration issued a package of policies, many initiatives were watered down and their passage slowed, depriving Koizumi of both momentum and results.

At the moment, Japan's general public is reportedly more nervous than angry according to the latest press reports. Many analysts believe that Koizumi will hold on to his position, but he will not be able to hold back the conservative and special interest factions of the government. Another year or two of getting by is a possibility, especially given Japan's conservative approach to its problems.

Demographic Changes

Notable demographic trends will influence the economic, social, cultural, and familial institutions of Japan. Among these trends, slower birthrates and grayer population will put pressure on labor markets, as companies scramble to find enough skilled and unskilled workers.

Japan's IT sector is already facing a labor shortage. *Japan Inc.*, an online publication following Japan's IT sector, reported in March 2002 that a collection of Japanese software companies has tried numerous ways to recruit new graduates with only

limited success.

Some believe that social mores will have to fall before the problem will be addressed. Working women in Japan, for example, typically occupy lower-level clerical positions. As its population grows older and its birthrate falls, however, Japan may continue to face a shortage of skilled IT workers, and women may be called upon to help make up the deficit. Government and business leaders will need to begin to recognize the value of this untapped pool of human capital.

Japan might also address its potential IT labor shortage by increasing the use of immigrant labor. The government of Japan is reportedly taking steps to reduce work experience restrictions for foreign IT engineers seeking work in Japan from the current 10 years down to 2-3 years. Relaxing traditional restrictions against citizenship would also make it easier for foreign engineers and software developers to work in the Japanese market.

Finally, the economic recession has forced a change in Japanese corporate attitudes, including attitudes towards foreign participation. Japan is realizing that it can not afford to shut out foreign participation if it is to introduce vital investment and competition into its national economy. Japanese attitudes toward foreign participation in its telecom sector have changed markedly since the country's economic downturn in the mid-1990s. As examples: in 1998 MCI WorldCom became the first foreign carrier to win a Type 1 license, and in 2001, Vodafone assumed control of Japan Telecom..

Government Policy and Legal Overview

In an effort to promote sustainable growth in

Japan's IT sector, the U.S. has been urging the Japanese government to establish a legal framework that ensures competition, promotes innovation, allows private sector regulation and protects intellectual property rights. Through the e-Japan strategy, as well as the subsequent e-Japan Priority Policy Program and e-Japan 2002 Program, the government endorsed these principles. Japan has also reaffirmed these principles as IT Sector Priority Items under the Three-year Program for Promoting Regulatory Reform, and Prime Minister Koizumi stated in a policy speech before the Diet that he is committed to accelerating IT reform.

The Japanese government has undertaken a revision of laws, rules and regulations in the areas of electronic signatures, privacy, Internet service providers, intellectual property, patents, network security, SPAM and on-line auction sites. Additionally, the private sector has been involved in developing initiatives for consumer protection and domain name registration.

In March 2002, METI announced guidelines for interpretation of the Commercial Code as applied to e-commerce and Internet-related activities. These guidelines will reflect the rapid development of the Internet and e-commerce in Japan.

The United States welcomes and supports Japan's efforts to revise its laws for the digital age, however, it maintains concerns over Japan's efforts in a few key areas, including intellectual property rights protection, on-line privacy, paperless transactions and electronic signatures. In the U.S.-Japan IT Working Group meetings under the Regulatory Reform and Competition Policy Initiative, the U.S. has made recommendations urging Japan to improve its laws and regulations in these areas. The two governments are working

together to try and address U.S. concerns.

e-Japan Strategy

The e-Japan Strategy represents a very positive step towards implementing the benefits of information technology, Internet and e-commerce in society, government and the private sector. The Strategy has been given the highest priority and the IT Strategy Headquarters, an interagency task force, is coordinating the initiative within the government. Officially the chief of IT Strategy headquarters is the Prime Minister. The Ministers of METI and MPHPT, the Cabinet Secretary, and the IT Minister serve as Deputy Chiefs; other members consist of the remaining ministers plus appointees from academia, private sector and some former members.

The Strategy focuses on four priority areas:

- Establish an ultra high-speed Internet network and provide constant Internet access at the earliest date possible;
- Facilitate electronic commerce;
- Realize an electronic government;
- Nurture high-quality human resources for the new era.

High Speed Network

For the first priority, the government wants to establish an ultra-high speed access network of 30-100 Mbps as the standard. This will provide this level of access to 10 million households. Secondly, the government wants to provide high-speed access to 30 million households. Japanese consumers will be provided constant Internet access at extremely low rates through fixed line, wireless and other kinds on networks. Finally, the Japanese government wants to promote a shift to Internet networks equipped with Ipv6.

Facilitating e-commerce

The government wants to promote e-commerce with small-to-medium size enterprises (SMEs) under the e-Japan Priority Policy Program. On October 1, 2001, METI established a website at (<http://www.chusho.meti.go.jp>) to promote the use of IT by SMEs including start-ups. The site provides information about support programs (i.e. loans, seminars/training) and e-mail contacts for business counseling. The site also distributes a free weekly e-mail newsletter, which contains news, and information to help SMES with their IT based management. Overall, the program will create awareness and lead to the development of business resources for IT applications among Japanese SMEs.

Realizing e-Government

Realization of Electronic Government was one of the original goals of the e-Japan Strategy (January 2001), aiming for the digitization of information and services provided by public administration by FY2003. This was later further developed with specific policy proposals in the e-Japan Priority Policy Program (March 2001), and the Koizumi administration made it a central feature of IT policy with the IT-related Reforms Work Schedule (September 2001). The Koizumi-led IT Strategy Headquarters has focused on four main areas of e-government--central government, local government, health, and electronic voting. Some major projects include:

- Development of an Authentication infrastructure for online public services; examining the feasibility of government-issue IC (integrated circuit) cards to citizens and business MPHPT will be the lead agency;
- Making applications available online--METI

--Integration of various import/export cargo systems into a One-stop service, coordinated effort among the ministries involved;

--Electronic bidding for public works by the beginning of JFY 2003 MLIT;

--Helping local governments develop online bidding-- MLIT and MPHPT

In June 2001, Japan began operating a database for all government procurement of all goods and services, with the exception of public works. The site operates in Japanese and English (for all procurements, an English translation of the necessary information will be posted), and includes an integrated system to register eligible contractors. A firm's qualification as a contractor with one agency is transferable to all agencies.

By the end of JFY 2003, all agencies will conduct electronic bidding with the exception of public works programs which will conduct e-bidding by the beginning of JFY 2003. MPHPT, the government coordinator, stated that procurement information would be on-line and included in the Kampo, the official government gazette. The database is at <http://www.chotatujocho.go.jp/va/com/TopPage.html>

MLIT oversees the development of electronic government for construction related procurement projects. The MLIT site (<http://www.mlit.go.jp/chotatsu/chotatsu.html>) includes projects commissioned by the government and quasi-government entities. It does not include projects commissioned by prefectural or local governments. These projects can be researched in a number of different ways (type of bid, date, location, etc.) on its website. The Japan Construction Information Center (JACIC), a semi-independent non-government organization, also runs the Continuous Acquisition and

Life cycle Support/Electronic Commerce (CALS/EC) system on its website (<http://www.cals.jacic.or.jp/>). MLIT stated it planned to post 100 tender notices on their site and electronic bidding can take place using their Electronic Bid Server Control (e-BISC) Center (<http://www.e-bisc.go.jp/>). Registration is required to take part in bidding.

According to a survey conducted by the MPHPT, over 84 percent of the prefectural and municipal governments in Japan have established web sites. This figure represents a 26 percent increase from 2000.

Throughout 2001, local government substantially increased their budget allocations for electronic equipment and services including web development by almost 40 percent. Many governments are requiring citizens in their jurisdictions to file applications and registrations over the Internet by 2003.

The Gifu Prefectural government has made IT development a high priority. The local government is proactive and Governor Kajiwarra serves as a member of the IT

Strategy Headquarters. Gifu has established its own IT Strategy which mirrors the national goals, including e-government. In August 2001, Gifu started an experimental electronic bidding system. The prefecture website is at (<http://www.sweetvalley.jp/e/news/news000014.htm>)

CHAPTER 2: TELECOMMUNICATIONS

Japan's telecommunications sector has experienced a remarkable period of transformation over the past five years. While Japan's telecom market has historically been highly regulated, the government of Japan has taken steps in recent years to facilitate competition and broader market participation. Through deregulation and the implementation of its World Trade Organization (WTO) commitments, Japan has fostered a more pro-competitive environment in the telecom sector. Recent Japanese regulatory changes, including the introduction of domestic and international resale, Internet telephony, cable telephony, and the elimination of foreign investment restrictions in facility-based carriers, have resulted in significant new commercial opportunities.⁴

While Japan's telecom sector has fared well relative to other sectors during Japan's economic downturn, it has still had its share of problems. Growth in fixed-line voice revenues has been slowed by the maturity of fixed-line infrastructure, the loss of traffic to wireless operators, and increasing downward pressure on subscriber charges. These changes have caused fixed-line operators to turn their attention to higher growth areas such as data and Internet provision.

Growth in the number of new mobile phone subscribers fell in March 2002 for the seventh consecutive month.

Wireless carriers are now signing up fewer than half a million new customers a month,

about one-third as many as a year ago. Interest in third generation (3G) wireless has so far been viewed as somewhat disappointing. In aggregate, Japan's telecom equipment market fell about 10 percent in 2001.

Within the telecom sector, however, certain sub-sectors continue to thrive. There was significant growth in certain market areas in 2001, including digital subscriber line (DSL) equipment and services. Severe price competition, however, caused the total value of the optical and data markets to decline.

Estimates of future telecom sector growth vary. For the equipment market, some sources predict a decline of about 7 percent in 2002, while others predict flat or slight growth. Perhaps the most likely scenario has the aggregate market remaining flat until the third or fourth quarter of 2002, then modest growth of 3 to 5 percent through 2003, mainly from the build-out of 3G wireless and broadband networks.

Relatively flat growth in the value of the aggregate telecom equipment market through 2005 is expected to be offset by growth in voice and data services, which are projected to have an average annual growth rate between 8-12 percent through 2005. The rate of growth in demand for wireless services is forecast to remain strong over the next several years. While the telecom market in aggregate is expected to experience reasonable growth over the next three to five years, valuations may not reflect this growth, mainly due to price competition in services and the installation and use of less-expensive networking equipment.

⁴ Observations made in this Chapter are based on the author's meetings with NTT DoCoMo, KDDI, CIAJ and Commercial Specialist with the U.S. Commercial Service in Tokyo. A full list of meetings attended by the authors is available at the end of this report.

Wireline

Telecom Equipment Market

Telecommunications equipment investment by carriers in Japan in 2001 constitutes the second largest investment of any industry in Japan, second only to investments by the electric machinery industry. The total Japanese market demand for telecom equipment in 2001 was estimated to be \$31.6 billion in 2001, down from \$36.6 in 2000 (see Table 2-1).

The telecom equipment market in Japan experienced a marked decline in imports, exports and local production in 2001. According to the Communications and Information Network Industry Association of Japan (CIAJ), the telecom import market and local production shrank 7.6 percent and 3.3 percent respectively in 2001 relative to 2000, and Japanese exports declined by 18.4 percent. These declines are blamed on the struggling domestic economy and the global IT recession, which caused many Japanese companies to reduce capital expenditures on telecom equipment in 2001.

According to Nikkei Business Publications (Nikkei BP), there is a widening gap between growing and declining market segments. As an example, sales of WAN nodes and access servers are declining as they are overtaken by high performance and multi-function routers/LAN switches. Sales of high-end routers, layer 3 switches and load balancers, used by telecommunications service providers, in contrast, are doing fairly well in Japan. Nikkei BP forecasts that the networking equipment market will increase about 11 percent in 2002, propelled mainly by broadband Internet-related products.

Wireline telecom equipment purchases in Japan are driven mainly by the expansion of data networks, as service providers

TABLE 2-1

Telecom Equipment Market (\$ million)

	1999	2000	2001
Imports	3,710	5,144	4,242
Exports	(6,188)	(8,014)	(5,839)
Local Production	30,736	36,671	31,667
Total Market	28,258	33,801	30,070

Source: CIAJ

TABLE 2-2

Networking Equipment Market (\$ million)

	2000	2001	2002 (E)
Router	1,529	1,465	1,796
LAN Switch	1,421	1,222	1,352
WAN Node	427	265	185
Access Server	400	190	181
Wireless LAN	61.1	52.1	47.9
Total	3,839	3,195	3,562
Annual Growth	31%	(-16.7%)	11.5%

Source: Nikkei BP

introduce new trunk networks and/or replace current voice-based systems with data systems to cope with increasing levels of data traffic.

Japan's router market exceeded \$1.4 billion in 2001. The market for high-end routers grew 10 percent over the year, while mid-range routers contracted 26 percent over the same period (see Table 2-2).

While the number of SOHO routers (small sized routers used by households and small-and-medium sized enterprises) increased from 950,000 units in 2000 to 1.46 million units in 2001, this increase was not reflected in total dollar value of these sales because of price reductions. Nikkei BP predicts that shipments of SOHO routers will increase more than 59 percent in 2002 to exceed 2.3 million units, valued at \$300 million.

The wireless access network (WAN) node and access server market declined markedly in 2001 to \$265.3 million and \$190 million, respectively. This was the result of the development and deployment of internet protocol and ADSL technologies. Because of increasing demand for ADSL service, ISPs and major telecom carriers did not invest in nodes and access servers at the previous year's level. Internet users in Japan are rapidly switching from ISDN to ADSL, resulting in the need for fewer access servers.

Japan's local access network (LAN) switch market was \$1.15 billion in 2001, a decline of about 14 percent from the previous year. The sale of in-box and in-chassis layer 3 switches grew 7 percent and 1 percent, respectively, in 2002, while sales of layer 2 switches dropped 25 percent in the same period. Major end-users of the in-chassis layer 3 switches are telecommunications carriers and data centers constructing ethernet networks and trunk networks for MAN (Metropolitan Area Network) and

fiber to the home (FTTH). The demand for in-chassis layer 3 switches is still increasing.

Japan's market for dedicated equipment for Internet services--equipment that improves the reliability, security and fault tolerance of the network such as load balancers, firewall and bandwidth management--grew 31 percent to \$348 million in 2001. Within this market segment, sales of load balancers are expected to grow 47 percent in 2002 to \$224 million, and dedicated firewall equipment market is should increase 47 percent to \$155 million.

Overall unit prices of wireless LAN equipment have decreased, but the market size in Japan has grown nonetheless by about 1 percent, due to the increase of shipments in 2001. So far, the market for wireless LAN products for private use has given momentum to price reductions. Enterprise users, on the other hand, have concerns about the security of their networks, and were reluctant to replace the existing wired line network with wireless LAN networks. IEEE 802.11.b is currently the de facto standard for such products in Japan. Widespread use of wireless LANs are expected when IEEE 802.11a products are more commonly available at lower prices.

Japan's voice over IP (VOIP) equipment market grew in 2001, driven by the telecom carriers' demand for cost competitive telephone services, while its enterprise market size leveled off. The introduction of VoIP gateways is being shifted from small- and medium-sized networks to large-scale networks. Telecom service providers launched IP telephone service at the end of 2000. These providers include Japan Telecom, NTT Communications and Fusion Communications. Fusion Communications provides telephone service using its VoIP gateway on the IP network, and had exceeded one million subscribers by the end of 2001. The IP-PBX market is somewhat uncertain, as

the demand from call centers is less active than before.

The terminal equipment market in Japan declined about 20 percent from about \$17.5 billion in 2000 to \$14.1 billion in 2001. The market is expected to continue to decline in 2002 due to slower growth of wireline subscribers and longer handset replacement cycles for wireless. (See wireless section for details.) The wireless terminal equipment market was significantly higher than wired in 2001, about \$12 billion versus \$2 billion. This trend is expected to continue.

Presently, the telecom equipment market in Japan is being driven mainly by the expansion of data networks to cope with increasing levels of data traffic. Service providers are building new trunk networks and/or replacing current voice-based systems with data systems. In a significant development for the telecom equipment market in Japan, Nippon Telegraph and Telephone (NTT) plans to transform its entire communications network into one that exclusively uses Internet Protocol (IP) technology. While circuit-switched networks require exchanges costing millions of dollars apiece, IP networks use lower-cost routers, reducing investment costs to as much as one-tenth that of existing networks.

NTT is already discontinuing capital investment and R&D in the exchanges and technology used in its existing telephone networks. NTT's plans call for converting its long-distance network within five years, and its remaining networks within 10 years. This includes DoCoMo's mobile network, which will be integrated into the IP long-distance network. As it converts its network to IP technology, NTT also plans to promote low-cost IP phone services, already offered by some start-ups in Japan. This process should cause rates to fall and increase customer convenience.

Japan's telecom equipment market is very competitive. Competitors in the market include world-class Japanese manufacturers like NEC, Fujitsu, Matsushita, Oki, and Hitachi. NEC and Fujitsu claim more than 50 percent of the total market. Foreign suppliers with significant market shares include Ericsson, Lucent, Motorola, Cisco, Nortel, and Nokia. (See Table 2-3)

TABLE 2-3

Wireline Telecom Market Share

Market Share %	NTT	KDDI	Japan Telecom	Others
1999	84	9.6	5.1	1.3
2000	84	9.5	4.8	1.7

(Source: Nikkei BP)

Foreign vendors supplied about 27 percent of the wireless, data and optical equipment markets in Japan in 2001. This is up substantially from 1995, when foreign suppliers only claimed about 7 percent of the market. While U.S. suppliers contributed about 50 percent of total telecom equipment import to Japan in 2000, 2001 showed a decline in market share. Imports from Asian countries have increased to account for nearly 45 percent share of the import market in 2001, increasing from just 28 percent in 2000. This is due in part to the fact that both Japanese and non-Japanese telecom equipment manufacturers have opened manufacturing facilities in Asian countries with cheaper labor costs.

Formal trade barriers are almost non-existent for telecom equipment in Japan. For example, Japan eliminated imports tariffs on telecom equipment in the 1980s. However, U.S. companies are more likely to find attitudes and customer education more formidable

barriers than outright exclusionary practices. The Commercial Service Japan can assist U.S. exporters with these issues. For assistance, contact your nearest U.S. Department of Commerce Export Assistance Center or the Commercial Service at the U.S. Embassy Tokyo (*see contact information in Chapter 7*).

Telecommunications Services

There are two types of licenses in Japan for telecommunications businesses; Type I and Type II. Type I is defined as telecom service providers that own their facilities, including networks. Type II is defined as all telecom businesses including carriers who provide services through leased circuits other than Type I. There are more than 10,000 service providers in Japan; there were 377 Type I carriers and 9,837 Type II carriers as of December 2001. All ISPs are either Type I or Type II telecom carriers.

At the end of 2001 there were 6,406 ISPs; 251 Type I carriers and 6,155 Type II carriers. A full accounting of carriers in Japan can be found on the MPHPT website at <http://www.soumu.go.jp>. The market size (combined sales) of all Type I carriers was about 17 trillion yen in 2000.

Number of Carriers

Among the Type I carriers, major players include NTT, KDDI, Japan Telecom and C&W IDC, as well as subsidiaries of the ten regional electric power companies, all of which are providing communications services for the domestic market. Japan's local telecom service market has been dominated by the monopoly supplier, NTT, which still has a 78 percent share of the domestic voice market and controls over 90 percent of the nation's local loop. While NTT remains dominant in services, new carriers are gaining market share - more than 300 new facility-based telecom service

providers, commonly called "new common carriers" (NCCs), are now operating in Japan in competition with NTT (see table 2-4). Until recently, the ten regional NCCs were restricted from interconnecting with each other and were limited to the parent company's electricity service area. Due to telecommunications deregulation, these companies are now allowed to interconnect with each other and compete with NTT and the other three long-distance NCCs.

The nature of telecom traffic in Japan is shifting from traditional wireline services toward broadband and wireless services. With the encouragement of the Japanese government, carriers are accelerating the build-out of fiber networks, and wireless operators are moving rapidly toward next generation services. Due largely to the rapid dissemination of wireless phones, the number of subscribers to fixed-phone services has declined, as has the number of public phone installations.

TABLE 2-4
Dedicated Line Market Share

Market Share %	NTT	KDDI	Japan Telecom	Others
1999	78.6	5.4	4.0	12.0
2000	74.3	8.1	5.1	12.3

(Source: Nikkei BP)

NTT Group

NTT Public Corporation was established in 1952 to operate all domestic communications. NTT was 100 percent owned by the Japanese government until 1985, when it was privatized into a joint-stock corporation, although the government continued to have 100 percent control. The government has gradually sold

off its stock to the public, and its stake is currently 46 percent. The Japanese government has committed to reducing its stake in the company, but poor economic conditions may slow this effort. In 1999, NTT was reorganized into three separate parts: NTT East Corp., and NTT West Corp. for regional telephony and NTT Communications Corp. for long distance and international.

NTT Communications Corp. operates intra-prefectural communications, multimedia networks and related services nationwide. The acquisition of Verio in 2000 helped NTT move towards its goal of becoming a global IP player. Increased competition has forced NTT Communications to slash its access charges and bundle Internet access with its voice packages. NTT East Corporation operates intra-prefectural communications and related services in the Hokkaido, Tohoku, Kanto, Tokyo and Shinetsu regions. It employs around 60,000 people.

In October 2000, NTT East and NTT West announced plans for a fixed-line version of highly successful mobile internet service 'i-mode' offered by sister company NTT DoCoMo. The so-called 'L mode' was launched in June 2001, delivering compact HTML content and e-mail capability to special handsets.

In January 2001, it was announced that NTT's regional carriers were to reduce its workforce by 6,000 more jobs than originally planned. NTT East and West had planned on a shared reduction of 21,000 employees as part of a restructuring scheme by the end of March 2003. Jobs are to be trimmed mostly through early retirement and a freeze on recruitment.

The year 2001 was difficult for NTT financially, and 2002 is expected to see a continuation of this trend. In recent years,

NTT has leaned heavily on its wireless subsidiary NTT DoCoMo's substantial profits.

For 2001 DoCoMo was unable to sustain its parent, however, and the NTT Group is expected to have a net loss of about \$6.5 billion for the fiscal year that ended in March 2002. NTT is blaming much of its loss on DoCoMo's investments in overseas mobile units. For the year, NTT says it will post losses on DoCoMo's investment in AT&T Wireless and on the investment in Dutch operator KPN Mobile.

In April 2002, NTT announced plans to cut 17,000 jobs to reduce its workforce to 199,000 by the end of March 2005 and trim its capital investment by about \$3 billion. NTT hopes these steps will translate into operating revenue of \$11.5 billion for the fiscal year ending March 2005. In addition to cost-cutting measures, NTT is focused on trying to improve high-speed Internet services.

Price competition for fixed-line services is being driven in part by Voice over Internet Protocol (VoIP) providers, particularly those using broadband systems. Providers like Yahoo and BB Net, whose networks are VoIP, charge low flat rates for calls. This poses a threat to NTT and certain other service providers. Yahoo has been bundling its voice service with its broadband offering at reduced rates. NTT now must scramble to compete, and is trying to reduce fixed-line costs.

Foreign participation in Japan's services market is a relatively new phenomenon. In March 1998, MCI WorldCom became the first foreign-owned company to obtain a Type I licence. The company was the first foreign Type I to lay its own fiber-optic cable. The company had been supplying Type II services since 1996, and is now providing a full spectrum of long-distance services, including international direct dialing, frame relay and end-to-end data services. Other foreign firms

are following suit. Other Type I carriers with foreign ownership/participation include KVH Telecom, Cable & Wireless, Hutchinson, Global One, PSINet, IBM and many others. A complete list can be found at:
http://www.soumu.go.jp/joho_tsusin/eng/index.html.

MyLine

Myline originated a few years ago to allow choices when connecting to fixed line carriers. Until 1985, domestic phone service was completely dominated by NTT. When competitive carriers entered the market, users were required to dial a special prefix to access the carrier they wanted, or else they would be connected to NTT by default. With Myline, users can pre-register for the carrier they prefer, and pick carriers in four different categories (local, different city but within the same prefecture, different prefecture, and international), thus eliminating the need to dial the prefix. The effects of Myline are, essentially, the effects of competition, where incumbent/large carriers are threatened and prices decline. Over the past year many carriers have been going to great lengths to attract new customers by lowering their fees - sometimes by tenths of a yen - to get more Myline customers. Ad campaigns by carriers touting their reduced costs have been prevalent. In addition, new carriers with lower rates and IP networks continue to enter the market.

Units of NTT have received most of the Myline registrations according to date, according to data released by the Myline Carrier Association. In the local phone market, NTT East and NTT West held a 71 percent and 76 percent market share of the fixed-line and pre-selection services respectively. KDDI held 12.8 percent, while

Japan Telecom lagged behind with about 7 percent.

WIRELESS COMMUNICATIONS

Overview

For the next 5-10 years, investments in wireless will focus mainly on the build-out of third generation (3G) networks. Despite its slow start, many analysts believe that third generation (3G) wireless services will increase the wireless subscriber base in Japan by as many as ten million users over the next three years. The MPHPT forecasts that total spending on 3G infrastructure will be as much as \$35 billion between 2001 and 2010, with much of the expenditures concentrated in the first five years. Despite the losses incurred by investment in foreign interests, investment capital is expected to be available. NTT DoCoMo still forecasts revenue of \$41.3 billion for 2002, an operating profit of \$7.2 billion and net profit of \$2.2 billion.

While more limited, there will also be continued expenditures directed toward 2G and 2.5G. By the fourth quarter of 2001, DoCoMo was reaching the capacity of its 2G network, and announced plans to invest some \$400 million to upgrade its i-mode service to expand capacity and increase data rates. Additional expansion is expected. Japan Telecom estimates J-Phone will have to spend about \$5 billion over the next few years.

Japan's wireless operators already make significant use of American technology and/or have agreements with U.S. companies. Small and medium-sized exporters can take advantage of connections they have with these U.S. suppliers. DoCoMo's i-mode network uses Cisco routers and Sun Microsystems servers. Baltimore Technologies recently reported a deal with DoCoMo to put the company's encryption key software into DoCoMo's new 503i i-mode handsets. The i-

mode business model borrowed liberally from the AOL business model, and in September 2000 DoCoMo acquired a controlling 42.3 percent stake in AOL Japan. DoCoMo offers AOL services over i-mode. In 2001, DoCoMo struck an agreement with Coca-Cola to provide i-mode at vending machines - the so-called c-mode. DoCoMo announced a partnership with Oracle to jointly develop and market advanced mobile services for corporate customers in Japan to allow subscribers to access Oracle's databases and other applications on their 3G handsets and other mobile devices.

In July 2000, Motorola was awarded a \$170 million contract from KDDI's Tu-Ka Cellular Tokyo to expand its PDC system in the Tokyo metropolitan area. The contract reportedly includes the installation of base stations, micro cells and base station controllers. Motorola was responsible for the installation of the original PDC system in 1994. Finally, KDDI is developing its CDMA2000 network based on Qualcomm technology.

As noted, shipments of mobile handsets in Japan declined for the first time last year. Handset shipments, including cellular and PHS handsets, fell 1.8 percent from the previous year to 50.77 million units in 2001 according to the Japan Electronics and Information Technology Industries Association. Sales of new handsets, which began slipping in June, fell by nearly 30 percent in the last quarter of 2001. While DoCoMo executives admit that the period of rapid growth may be over for Japan's wireless sector, they are confident that there will continue to be stable growth.

This decline in sales has been attributed to both the maturation of the market and the nation's continuing economic slump. The decline was compounded by problems that

have plagued the industry for much of the last year. DoCoMo had to delay the launch of its 3G services due to problems with its handsets, and KDDI was also forced to recall about 700,000 Sony handsets due to glitches. Forecasts call for wireless phone shipments to remain stagnant in 2002.

Since the growth in the number of subscribers in the cellular phone/PHS market began to decline, demand from users who buy new models in exchange for older units has been stagnant. The upgrading cycle for cellular/PHS handsets has expanded to as long as 22.6 months, adding nearly 5 months since the survey was first conducted in July 2000. Respondents to a Nikkei BP Consulting survey, asking participants what made them upgrade, cited improved color LCD displays, large display screens, clamshell design or i-mode access. Respondents without mobile Internet access said they switched to a new handset to obtain i-mode, J-Sky or EZweb services. The survey noted, however, that these factors are peaking, and that new services may now be the main drivers for future upgrades.

With the extraordinarily rapid growth of wireless⁵ services, wireline no longer dominates Japan's telecommunications sector. In 2000, wireless subscribers overtook wireline users, and wireless currently represents more than half of total spending on the entire telecom sector in Japan. According to the Telecom Carriers Association, there were more than 74.8 million total subscribers to cellular and Personal Handy-phone System (PHS) services at the end of March 2002, representing a penetration rate approaching 60 percent, up from 64.8 million and 51 percent

⁵*Note: Japan's wireless sector consists of cellular and PHS (Personal Handy-Phone System) as well as radio paging and ship phone services. This report will focus primarily on the cellular and PHS equipment and services markets.*

penetration at the end of March 2001. While subscriber growth has slowed somewhat recently, the Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) forecasts that there will be nearly 100 million cellular subscribers and a penetration rate of about 75 percent by the year 2005. The total wireless market in Japan is projected to exceed \$8 billion in 2002.

Although Japan was one of the first countries to introduce cellular service in 1979, growth lagged behind the rest of the world and didn't begin accelerating until 1994. The success of wireless services over the last eight years can be attributed to many factors including deregulation, competition, technological innovations, aggressive marketing and government support stemming from a need for wireless emergency communications services. Wireless is also succeeding because of the relative inflexibility and high costs associated with wireline networks.

Internet-compatible wireless phones have gained popularity over the past few years. Japan is the first country to have full-time, always-on Internet access via mobile phones, and the mobile phone has become a key form of Internet access for Japanese consumers. About three quarters of Japan's wireless subscribers are data-enabled, giving Japan the most wireless data users of any country in the world. Reasons for the popularity of these phones include a population that is eager to use the Internet, but stymied by expensive wireline fees, has a penchant for gadgets, is consumption-minded, and is eager to purchase the latest fad. The global wireless industry is closely watching Japan's experience with wireless Internet access services.

Service Providers

Japan has three major wireless service providers: NTT DoCoMo, KDDI, and J-Phone.

NTT DoCoMo: Presently the world's largest national wireless carrier, NTT Mobile Communications Networks, Inc. - commonly known as NTT DoCoMo - inherited the infrastructure and nation-wide service areas of its parent company NTT, which spun off its wireless operations in 1992. Just as NTT dominates the Japanese telecom market in both long distance and local loop services, DoCoMo dominates the Japanese market for wireless services with about 59 percent of the wireless voice market, with 40.8 million subscribers. The subscriber base increased by 600,000 from February to March 2002. (See Table 2-5). DoCoMo is projected to add more than 3 million new subscribers in 2002-2003. DoCoMo is also a world leader in wireless Internet access with its very popular *i-mode* service and recent launch of third generation (3G) services.

KDDI: The wireless subsidiary of KDDI has about 18 percent of the wireless services market in Japan. KDDI was created through a merger of wireless carriers DDI and IDO, and KDD - the former state-owned overseas long-distance monopoly carrier) in October 2000. The operator currently provides mobile services on a Portable Digital Cellular (PDC) network operated by the Tu-Ka Group (with about 5 percent of the market) and a packet-switched cdmaOne network operated under the name AU launched in 1998.

J-Phone: J-Phone, a subsidiary of Japan Telecom now majority-owned by Vodafone, has about 17 percent of the wireless services market in Japan. J-Phone is reportedly the fastest growing wireless operator in Japan, and many analysts predict it will surpass KDDI by the end of 2002. J-Phone also operates a PDC network.

PHS

PHS is a digital technology unique to Japan that is not compatible with other systems in the world. Introduced in 1995, PHS uses the 1.9 GHz frequency band and has a normal radius of only 100 to 500 meters from hundreds of small, relatively inexpensive antennas. In contrast, the radius of cellular phone antennas reach as far as 1,000 to 2,000 meters, requiring fewer antennae to form a network. PHS service names include *Astel*, KDDI's *DDI Pocket* and *DoCoMo PHS*.

PHS was initially marketed as an inexpensive, ubiquitous service usable anytime, anywhere, including in subway stations where cellular phones were initially inoperable. PHS has certain notable limitations, however and the services did not grow as fast as originally anticipated. For example, more than 100,000 PHS antennae were required for Metropolitan Tokyo alone, for example, and PHS service providers experienced difficulty in securing antenna sites due to costly and cumbersome negotiations for rights of way. In addition, large amounts of investment went into labor costs. Finally, PHS and cellular systems were originally incompatible, so that a PHS subscriber could not talk to a cellular subscriber or vice-versa.

As a result, even though call rates are considerably higher with cellular phones, consumers currently prefer cellular's wide-ranging connectivity to the current limitations of PHS. Finally, unlike cellular handsets, PHS handsets cannot be used while riding at fast speed in trains and cars. By the end of March 2002, there were 5.7 million subscribers - 2.9 million for DDI Pocket, 1.9 million for NTT DoCoMo, and 0.8 million for Astel - down substantially from the high of 7 million registered in 1997. It now appears that PHS is destined

to become a niche market, used mainly as a low budget mobile data service.

i-mode

NTT DoCoMo's *i-mode* wireless Internet access service is currently the most successful wireless Internet service in the world and, despite its relatively slow data transfer speed (9.6 kbps) is the most popular ISP in Japan (see Table 2-6). DoCoMo and Sony recently announced a collaborative effort to put PlayStation games on cell phones. The collaboration will include DoCoMo's global partners: AT&T Wireless, KPN Mobile, Hutchison, KG and Telecom Italia Mobile.

One major reason that *i-mode* is so popular is because of its low cost. Phones operate on packet-switched as opposed to circuit-switched networks, and subscribers pay for the amount of data sent or received instead of by the minute. This makes the service inexpensive when compared with Internet messages sent over regular phone lines, which are billed by the minute. In fact, sending or receiving *i-mail* is cheaper than making an ordinary phone call. Another reason *i-mode* is popular is that mobile phone users can receive invoices for purchases made on the web along with their monthly phone bill, a significant convenience that mitigates many users' fears of paying for something online. A significant measure of *i-mode*'s success has been DoCoMo's ARPU (Average Revenue Per Unit) level for data, which has increased substantially compared to voice.

Other Wireless Internet Access Services

While *i-mode* can reasonably claim to be the de facto standard for mobile Internet access in Japan, KDDI and J-Phone also offer 2.5 G wireless Internet and data services, named EZWeb and J-Sky respectively. KDDI and J-Phone are working hard to combat their second tier image using various innovations. For example, the increasing popularity of J-

Phone s service has been attributed to new J-Phone handsets which incorporate cameras, and plans are in the works for handsets that can display 3D images using Java technology. The impetus behind J-Phone's success in attracting new subscribers has been "Sha-Mail" a service that allows users to take photos with cameras that are built into their handsets and then send them to other phone users via email. About 4 million Sha-Mail phones are now in use, a third of the total number of J-Phone handsets in the market.

Table 2-5
Subscribers By Operator (Not Including PHS) (Source: Nikkei BP)

System	Operating Group	Total (Mar 02)
W-CDMA	NTT DoCoMo	89,400
cdmaOne	KDDI AU	10,822,400
PDC	NTT DoCoMo	40,694,000
PDC	KDDI	1,391,900
PDC	J-Phone	12,232,000
PDC	Tu-Ka	3,891,400
	PDC Subtotal	58,209,300
	Total Subscribers	69,120,600

KDDI s is also marketing EZWeb through its innovations, touting "IQ Net", an in-building high-quality network system that reportedly eliminates "dead zones" by installing wireless base stations linked to KDDI s optical-fiber network in locations such as building interiors and in basement level areas. KDDI/AU also offers a GPS-enabled handset. Launched at the end of 2001, KDDI has sold about 400,000 units by March 2002. KDDI has reportedly signed roaming agreements with seven foreign operators in half a dozen countries. These are reported to include China Unicom Ltd, which says it will enable AU customers

to roam onto its networks in Shanghai and Beijing.

DoCoMo has been having its share of problems these days. The pace of i-mode subscriptions has fallen recently from an average of 1.9 million monthly a year ago to under 500,000 in February 2002. The debut of DoCoMo's 3G wireless service, dubbed FOMA for Freedom of Multimedia Access, has been disappointing. In addition, DoCoMo is expected to have to write off about half of the \$13.5 billion it spent in the past two years on its investments in other carriers like KPN Mobile and AT&T Wireless. Despite these issues, with a 58 percent of the Japanese wireless market DoCoMo will continue to be the predominant force in wireless for the foreseeable future. This is in part because other wireless operators have issues to deal with as well. KDDI has an estimated debt load exceeding \$12 billion. Japan Telecom's overseas businesses have also shown some deteriorating profitability.

In Japan s competitive climate, wireless carriers will have to increase revenue through creative marketing and new, high-margin services instead of depending on new subscribers for growth. One such promising business is corporate services. As an example, Japan Telecom now provides mobile high-speed data service, accessible from wireless laptops, at a cost of \$570 for a year of unlimited use.

DoCoMo is in the process of taking i-mode beyond Japanese borders. The move is viewed by DoCoMo as the first step in its global strategy, and therefore success is considered critical. (See Attachment 4.)

Java

Java is expected to be a major driver of Japan s wireless sector. Developed by Sun Microsystems, Java is essentially an operating system that can make handsets more like

computing devices, allowing the user to download and store files, execute applications and display dynamic Web content. Java allows developers to write relatively small programs that can be downloaded over wireless networks and run on devices with slower processing speeds and smaller memory capacities than desktop PCs. This is significant because in the past, wireless handset replacement was so rapid that application developers could not keep pace. With Java, new applications can work on all handsets. Japan has its own localized versions of Java, the most prominent is known as *J-Blend*.

The increasing importance of Internet protocol (IP) provision and application development has given added momentum to mobile Java technology in Japan. DoCoMo connected 200,000 subscribers to its i-appli Java i-mode applications within one week of its launch. J-Phone has a cooperative arrangement with Vodafone to develop Java phones, and is expected to launch Java services in June, 2002. Also in June, KDDI will reportedly introduce Java-enabled phones. The new phones will allow programmers considerably more freedom to create software that supplements the phone's own capabilities -- a major point of differentiation that, with the right type of applications, could improve the competitive position of KDDI and J-Phone.

TABLE 2-6

Wireless Internet Access Services

(Source: Nikkei BP)

Group	Service	Users
NTT DoCoMo	i-mode	32,156,000
J-Phone	J-Sky	10,130,300
KDDI	EZWeb	9,638,800
Total (March 2002)		51,925,100

Java on wireless handsets is showing signs of becoming very popular with Japanese consumers. NTT DoCoMo reported in the first quarter of 2002 that it had about 11 million users of the company's Java-capable i-Appli phone. According to DoCoMo's Business Manager, Takeshi Natsuno, i-Appli phone users are heavier users of wireless web sites than i-mode-only users, accounting for more than 50 percent of all web usage. Currently, there are 241 official i-Appli sites, and 5,035 unofficial ones. Growth is also due to aggressive sales of packaged software and the emergence of middleware, as well as the fact that mobile phone carriers enhance the functions and services that terminals offer.

BREW

Binary Runtime Environment for Wireless (BREW) is an application platform that runs on Qualcomm wireless chipsets, the MSM series. To gain a foothold in the Japanese market, Qualcomm started offering a free online Japanese version of BREW software development kits, a tool to develop software applications for cellular phone handsets. Most cdmaOne handsets used by KDDI use MSM chips. KDDI has high hopes for BREW, and is upgrading its network to Qualcomm's 2.5 generation, called 1xRTT, so users can

download applications developed with BREW directly to their handsets.

Third Generation (3G) Wireless

Third generation (3G) wireless involves the introduction of significantly greater levels of bandwidth to relieve congested networks, facilitate faster transmission of data, and introduce new applications and services. Data speeds of up to 384,000 bits per second (bps) allow users many new applications, including downloading video and audio clips and holding video conferences.

Licensing of new 3G operators has already been completed in Japan. In July 2000, MPHPT awarded three 3G licenses to NTT DoCoMo, the J-Phone Group and KDDI. No auction fees were charged. DoCoMo became the first carrier in the world to offer 3G services with the commercial launch of its FOMA (Freedom Of Mobile multimedia Access) service to the greater Tokyo area in October 2001. The service was gradually expanded to a number of major cities, and DoCoMo expects the service will be nationwide within about one year, have six million users in three years, and post a profit in four years. New FOMA services are being introduced at intervals. In April 2002, for example, DoCoMo launched a trial version of its upcoming 3G streaming video service. The service, called V-Live, streams both live and archived video content to phones and Personal Digital Assistants (PDAs) via its FOMA service.

DoCoMo's initial total investment in the 3G network has been about \$2-3 billion. DoCoMo will reportedly spend close to \$8 billion on its 3G network by 2005. While services and service areas will be limited at first, the MPHPT projects that the market for 3G in Japan will grow to more than \$350 billion by 2010, 600 percent higher than its current value. Of this amount, 66 percent will come from content and e-commerce

services. Nomura Research Institute forecasts that many current subscribers will switch from 2G to 3G after spring 2003, when the 3G service area coverage rate is slated to expand. They also project that 3G subscribers will account for 40 percent of the entire mobile phone market at that time.

Despite these lofty expectations, FOMA's track record to date has been mixed at best. Initial demand was hampered by a shortage of handsets. By the end of 2001, FOMA had only 27,000 customers, and only passed the 100,000 subscriber mark in late April, 2002. Notably, DoCoMo's 2G network gained over a million new customers over the same time period. DoCoMo had only released between 20,000 to 30,000 FOMA handsets onto the market in the early months. Preliminary indications of Average Revenue Per User (ARPU) for FOMA has also not been impressive.

A number of reasons have been cited for FOMA's disappointing beginning, including limited geographic coverage and the lack of dual-mode 2G/3G handsets, which prevented subscribers from roaming on DoCoMo's 2G network outside of Tokyo. FOMA handsets are also much more expensive. Technical problems with the handsets also arose toward the end of the year. For example, DoCoMo was forced to recall 1,500 handsets almost immediately after the faults were discovered. While DoCoMo's target was 150,000 subscribers by March 2002, this goal was also not attained (89,000 at the end of March, 2002). In a recent survey by Nikkei BP, users said the service area was still very limited, and nearly a quarter of respondents claimed they saw no significant difference in usability compared to regular handsets.

Nonetheless, DoCoMo is staying with its prediction for 1.5 million users by 2003, and believes that since 3G antennas can handle vastly greater amounts of traffic than their

predecessors, installing the new infrastructure has advantages even if 3G is slow to take off. DoCoMo is rolling out 3G networks in several other major cities, including Osaka and Nagoya. Coverage had reached 60 percent of populated areas by the end of April 2002, and is expected to be expanded to 90 percent of the population by the third quarter of 2003. DoCoMo is also looking to the recent entrance of a rival, KDDI, to stimulate the 3G market.

KDDI launched 3G services on April 1, 2002. Services will cover 33 municipalities-including Tokyo, Osaka, Nagoya and 12 other major cities in Japan-and 477 regional communities. KDDI ultimately plans to expand services gradually to other parts so that, by the end of 2002, 90 percent of the population will be within the cdma2000 service area. KDDI reported 330,000 subscribers for its 3G service at the end of April 2002, surpassing DoCoMo. By the end of March 2003, KDDI predicts it will have some six to seven million 3G customers. KDDI reports that about two thirds of its current 3G customers are existing KDDI mobile customers.

Subscribers in major Japanese cities will reportedly have service with packet network transmission rates of 144 kbps through its cdma2000 1xRTT, beginning in the second quarter of 2002. KDDI's data rates are only half as fast as DoCoMo's, however the company is charging only about half the price for its service. Some in the industry refuse to recognize KDDI's service as true 3G due to the lower data speeds.

Innovative Wireless Applications in Japan

- " *Japan Railways East plans to introduce a new wireless commuter pass that requires no insertion of commuter tickets into collection slots. The card can be built into and recharged from a cell phone.*
- " *KDDI and the AU group will introduce a service that uses bar code images displayed on cellphones LCDs as concert tickets. Ticket holders can have a two-dimensional barcode image displayed on their cellphones LCDs read at the door.*
- " *Mitsubishi Corp. plans to begin a settlement service using mobile phones and bar codes in September, in collaboration with convenience store chains. Users of this service will download two-dimensional (2D) bar codes into their mobile phones and have the codes scanned at convenience stores to pay utility bills and others.*
- " *A new DoCoMo service called "i-area" will allow DoCoMo users to select an area, then automatically download shopping, maps, and weather for that area.*
- " *In February 2002 DoCoMo announced that it would be studying ways of integrating its 3G FOMA service into cars with automaker, Nissan.*

KDDI comes to the 3G competition claiming certain advantages. Its new cdma2000 1xRTT service is an improved version of the cdmaOne service, making it easy for users to send and receive video images which it will need to compete with J-Phone. The new service is designed to take advantage of the existing service and minimize additional investment costs. Moreover, KDDI recently introduced WAP 2.0 into its AU mobile phone service. WAP 2.0 phones can access compact HTML (cHTML) web sites, currently only viewable by i-mode users. Finally, KDDI's CDMA network in Japan will be cheaper to upgrade to 3G, compared with DoCoMo, which is having to do a full network build-out for FOMA. KDDI is expecting its cdma2000 1xRTT to be highly successful, and the company plans to shift subscribers from its current cellular network to the cdma2000 1xRTT network as quickly as possible. In

fact, KDDI surpassed NTT DoCoMo in net new subscribers for the first time ever in the month of April.

To be able to compete effectively with J-Phone, KDDI is offering a series of new handset models which feature built-in miniature cameras. The company plans to ship seven million handsets for the system by the end of March 2003. The handsets will reportedly be priced at about half the cost of FOMA handsets.

J-Phone will be the last Japanese operator to launch 3G services commercially. J-Phone originally planned to launch 3G services in Tokyo, Tokai and Kansai by December 2001, with the other regions joining in by October 2002. However, J-Phone has delayed the launch of its 3G services in Japan until December 2002. The company reportedly wants to make sure that the new service complies with industry standards. One of the primary reasons for the delay, according to some observers, is that Vodafone wants the new service to be compatible with Vodafone's upcoming European 3G services. J-Phone may still launch a trial 3G service in June to comply with the terms of its 3G license.

J-Phone's decision to wait until the end of this year to start its 3G service has both good and bad implications. On the one hand, J-Phone can remain untarnished by early problems and learn from the mistakes and success of DoCoMo and KDDI, then launch into a market that has some experience with the use of 3G. With J-Phone's strength in marketing, this could be an advantage. On the other hand, latecomers to the 3G market might find it hard to build up their market share. Most predict that the wait-and-see approach will serve J-Phone well.

In an effort to allow consumers freedom of choice, the MPHPT has said that it will

introduce number portability, a system that will allow 3G mobile users to transfer their cell phone numbers between carriers. If someone is dissatisfied with their carrier's services, they will no longer have to lose their phone number if they take their business to another carrier.

There are also niche players in the wireless broadband sector. For example, a Softbank subsidiary called IP Revolution has just won a bandwidth licence from the MPHPT for a high-speed wireless broadband service due to start in Tokyo, Nagoya and Osaka from March 2002. The new service will target corporations who are unable to access fiber networks, while Softbank's other wireless subsidiary in the broadband space, SpeedNet, will supply consumers.

2.5G a Predictor of Success for 3G?

The success of 2.5G in Japan can offer some insights into the prospects for the much anticipated 3G wireless services. According to a Nikkei NetBusiness survey, as many as 32.4 percent of people are interested in online shopping using their mobile phones, and 18 percent of wireless users have already made more than 10 purchases via their mobile phones. Goods purchased through online shopping as a whole typically include books and magazines, food, computers and clothing. Service purchases include online reservations for airline tickets, train tickets and hotel reservations. Contents and services accessed through mobile devices varied a great deal depending on age and gender.

Fourth Generation (4G)

Despite the fact that Japan's 3G rollout is just getting underway, NTT DoCoMo reportedly plans to begin testing fourth generation (4G) mobile phone network technology in Japan in the near future. This gives NTT DoCoMo the

opportunity to continue to dominate the market by setting industry standards. As noted, NTT DoCoMo has close ties with its network equipment providers and handset manufacturers and can basically dictate equipment specifications to manufacturers and content requirements to content providers due to its commanding market position. While 4G services are unlikely to be implemented before 2010, the company will reportedly conduct feasibility trials on 4G to get an advanced understanding of how the technology works, which will allow it to continue to provide advanced information to its hardware partners and developers.

NTT DoCoMo says it expects the new wireless technology to have transmission speeds up to 200 times faster than 3G wireless networks. The technology will allow wide-scale video conferencing and other features like high-definition video on their handsets.

Wireless Handsets

The leading suppliers of handsets in Japan are Japanese. A report from the Gartner Group states that Matsushita claims 26 percent of handset sales in Japan, followed by NEC with 24.7 percent, Mitsubishi Electric with 15.1 percent, Sharp with 10.9 percent, and Sanyo with 6.3 percent. Japanese cell phone makers are saying that they are launching aggressive new marketing plans for the USA and Europe.

Foreign manufacturers, including Nokia, Ericsson, and Motorola, also supply the market. Ericsson, the largest foreign supplier with about 20 percent of the market, has been supplying NTT DoCoMo with digital cellular handsets since at least 1994. Ericsson has also been selected by both NTT DoCoMo and Japan Telecom to supply the W-CDMA network infrastructure for their 3G mobile systems. Motorola and Nokia claim 9 percent and 5 percent of the

wireless equipment market respectively. Competition between handset makers will become increasingly intense both in Japan and globally.

Wireless handsets today are not what they used to be. Devices now range from basic unwired voice telephones to small hand-held computers providing the functionality (without the capacity) of desktop PCs. Handsets used in Japan's wireless sector are leaders in this miniturization and convergence revolution, incorporating functions from the cameras to game machines, PDAs to remote controls. This leadership position can be attributed to the Japanese consumers' affinity for a combination of complexity and subtlety, along with a taste for fashion, simplicity and space conservation. This phenomenon comes with drawbacks, however. The race to create the terminal with the most bells and whistles has led to problems in the Japanese market, not the least of which was DoCoMo's embarrassing recall of Java-enabled handsets following the launch of FOMA.

To take advantage of all the added bandwidth capability, wireless handsets are rapidly changing in Japan. Current browser phones' displays are mainly 2 inch diagonal 120 dots by 160 dots, but are reported to shift to 2.2 inch diagonal 176 dots by 220 dots within a year. Telephone handset manufacturers are now developing LCDs for handsets with 2.6 inch diagonal 360 dots by 480 dots, with the idea being they will be able to display the TV programs of terrestrial digital broadcasting scheduled to launch in 2003. Browser phones are reportedly incorporating Bluetooth functions and will include a memory card slot by the beginning of 2004, which will facilitate using mobile phones with PDAs.

In January 2002, NTT DoCoMo unveiled CamessePetit, a palm-size e-mail terminal equipped with a digital camera, on Jan. 24. When connected to a PDC-format digital

cellular phone, it can send still color images taken by the camera as an attached file along with text to be read as an e-mail message. It is capable of sending or receiving images to or from PCs as well as between the CamessePetit units. Also, it can send text within 3,000 characters or images of 320 x 240 dots or fewer. CamessePetit is intended to be a special terminal for NTT DoCoMo's new e-mail service called Snap Mail. CamessePetit is made by Toshiba Corp.

KDDI also plans to launch five new cdma2000 handsets. These new models are compatible with the GPS '*eznavigation*' personal positioning service, with '*ezplus*,' which can run Java applications and with WAP 2.0, allowing users access to unofficial i-mode sites. As with the GPS handset, which is equipped with a high resolution camera, all these handsets meet customer needs for compact, lightweight, handsets with extended life cycles and low prices. In the future, KDDI plans to upgrade the Movie handset, which is compatible with the '*ezmovie*' moving image distribution system, to provide users with richer content, alternative uses and a variety of business solutions.

The advent of 3G wireless services spawned a number of partnerships between domestic and foreign equipment suppliers in the Japanese mobile market over the last few years. In 2000, Toshiba Corp. announced an agreement with Siemens, focusing on the joint development of GSM and W-CDMA 3G mobile handsets. (The partnership has reportedly been on hold due to technical problems.) Fujitsu Ltd and Oki Electric Industry Co. have formed a joint venture called Mobile Techno Corp. to design and develop base stations for 3G services. In 2000, domestic firm Mitsubishi and Intel of the United States announced they would jointly develop chipsets for 3G phones using the W-CDMA standard. In May 2000,

French telecommunications equipment maker Alcatel and Fujitsu announced that they were forming a joint company to develop and make 3G mobile telephone systems to support the early launch of 3G telecommunications services based on W-CDMA technology. In addition, Toshiba and Mitsubishi may jointly develop 3G handsets. In 2001, Sony forged a handset venture with Ericsson, and NEC and Matsushita also announced a 3G alliance. Fujitsu recently formed a 3G handset partnership with Sagem (France).

CHAPTER 3: INFORMATION TECHNOLOGIES (IT)

Computer Equipment, Software and the Internet

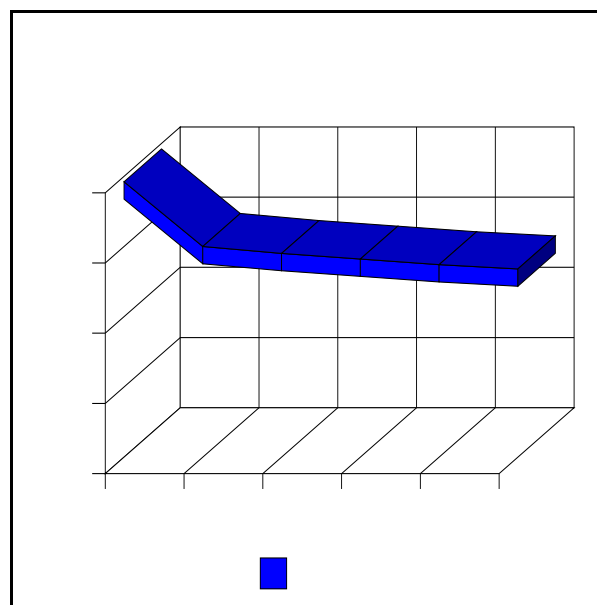
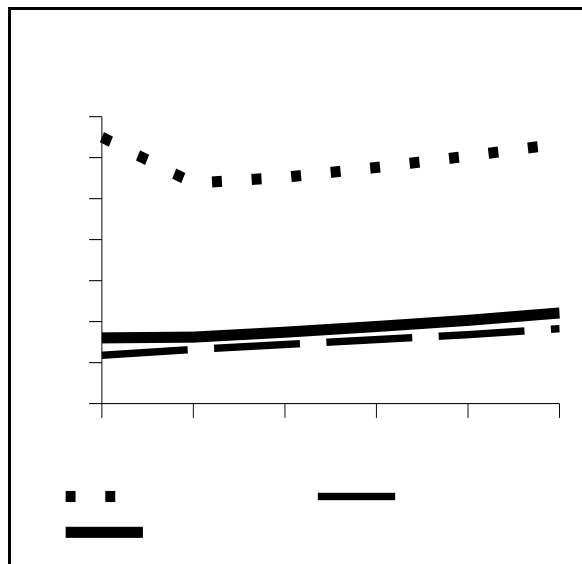
COMPUTER EQUIPMENT

The computer equipment market in Japan is expected to experience negative growth in 2002, dropping to \$48.6 billion from \$52.6 billion in 2001, according to IDC. With modest growth starting in 2003 (see Figure 3-1).

Japan is home to some of the world's largest computer equipment manufacturers, including NEC, Fujitsu and Hitachi. Many of these large corporations have been struggling as result of the prolonged economic downturn in Japan and a saturation of the market leading up to and after the Y2K time period.

Personal Computers (PCs)

There were 14.1 million units sold in 2001, which was an increase of only 0.3 percent over 2000 (see Figure 3-2). The enterprise market in Japan has been stagnant for some time and this trend is likely to continue in the near term. Weak growth is expected to occur in the home market. Japan has a relatively low home PC penetration rate, which leaves room for growth in the home PC sector. The dramatic increase in home availability of broadband is expected to modestly drive demand for home PCs in the next few years.



Computer Servers

The server market in Japan has been experiencing negative growth for the past three years. According to IDC, the server market is expected to bounce back in 2003 with a 2.5 percent increase, reaching nearly a 7 percent growth rate by 2005.

Mainframe demand has fallen gradually over the past five years as users have downsized to client-server systems.

Japanese computer suppliers such as Fujitsu, Hitachi, and NEC are very competitive in a wide variety of computer systems, from PCs to supercomputers, and use this strength to supply complete systems. U.S. firms such as IBM, Apple, Compaq, Dell, and Gateway also compete there, having a stronger presence in the private sector market than in the public sector. U.S. suppliers' share of Japan's computer market (public and private sector combined) was estimated to be nearly 25 percent in 1999.⁶

Other Computer Equipment

The Japanese peripheral market is mature and as such is not expected to grow dramatically in the coming years. Currently valued at \$8.1 billion, the market is expected to increase to a total value of \$11 billion by 2006. This market is dominated by Japanese firms.

SOFTWARE MARKET

As equipment sales have slowed in the past few years despite increasing Internet use, new and sophisticated software is in demand. Japan's software market reached revenues of \$14.8 billion in 2001 according to IDC.

The Japanese software market is dominated by American imports. Of the total imported software market in Japan, 91 percent

originates in the United States. The customized software market in Japan accounts for 45 percent of the total software market. Japanese industry requires software producers to conform to their existing business models. Japan does not have a large domestic software industry and imports make up almost 50 percent of the total market. As Japanese companies continue to streamline their business processes and look for ways to cut costs they will continue to seek out American software providers.

Business process re-engineering is gaining the attention of Japanese businesses, spurring strong demand for software to improve efficiency, namely database management systems (DBMS), customer relationship management (CRM), and groupware software. Many Japanese firms are starting to implement e-commerce strategies, and demand for Internet and e-commerce-related software is forecasted to be very high in the coming years. In addition to sophisticated software, the expected increase in e-commerce will drive demand for Internet/Web software, e-mail translation software, and security and network software.

As in the United States, the dominant operating system (OS) in Japan is Microsoft Windows, which is forecasted to continue to be the main OS of all PCs and servers. According to IDC, Windows NT currently commands slightly more than 70 percent of Japan's server OS market, while various varieties of Unix account for 20 percent. The use of Linux, although relatively small, is growing. One factor expected to propel the use of Linux is growing interest by major server vendors such as Fujitsu and NEC, as well as among end-users. An April 2000 survey of Japanese companies listed on the Tokyo Stock Exchange found that 33.3 percent were interested in Linux. IDC Japan forecasts that the Linux market will grow 45

⁶ Japan Information Services Association 1999

percent annually to reach 12 percent of Japan's server OS market by 2004.

Internet security is expected to be a growth sector in Japan in the coming years. As more and more Japanese consumers begin to use the Internet for e-commerce, retailers are looking for the best possible way to ensure that their Web sites are secure. In a society that is highly security conscious, Internet security providers will be able to find many opportunities in the future.

With the Japanese government investing heavily in e-government, opportunities exist for US firms with experience in working with large organizations to digitize their business practices.

Japanese buyers often equate U.S. software with quality and state of the art technology. As result, software is one of the best prospects in Japan for U.S. companies that are willing to invest the time and resources in to sell to Japan.

Furthermore, there is an acute shortage of qualified software developers in Japan. The education system is not providing the type of skilled worker that many software firms need. This contributes to the competitiveness of US software providers in Japan, as well as opens the door for U.S. IT services providers.

Localization is key

One of the biggest perceived impediments to selling to Japan is the need for localization.

Software sold to Japan must be localized, a process which requires not only a clear, concise translation of the language used in the interface and documentation, but an overhaul of the single-byte character set used to represent English letters into a double-byte system suitable for Asian languages. The issue of localization is key to any successful market entry strategy in Japan. There are many firms both in the

United States and Japan that can ensure software is localized for the Japanese market. The Commercial Service in Tokyo can assist you in finding resources to assist in this process.⁷

IT SERVICES MARKET

The IT services market is set to grow 10 percent as a whole by 2005 according to Gartner Group Japan. Major growth areas are information systems and applications outsourcing, of which the latter is expected to become more popular as Japanese SMEs increasingly turn to application services providers (ASPs) to out source and save money on certain IT functions.

The total expenditures for the ASP market in 2000 were \$18.6 million, and the market will continue to grow at an average rate of 104.1 percent per year to reach the \$661 million range by 2005, according to IDC.

This strong growth is related to a number of factors. Enterprises will continue to use ASPs in order increase their efficiency. With the growth in electronic commerce, there will be a strong need for CRM and e-commerce applications.

Personal applications such as MS Office, are expected to lead in ASP growth. Analysts believe this growth will only continue as Japan becomes more of a wired society. As a result, this category will grow at the average annual rate of 124.3 percent from \$1.5 million in 2000 to the \$101 million range in 2005.⁸

As for enterprise applications, which make up more than half of Japan's total expenditures on ASPs, CRM and applications related to e-commerce will

⁷ See contact information in Chapter 7.

⁸ Nikkei BP <http://www.asiabiztech.com/>

continue to increase in the coming years, leading the entire ASP market.

U.S. firms compete more strongly in Japan's software and services than computer equipment markets. In fact, the domestic software industry is very small, and most of its production is aimed at mainframes or based on proprietary standards. Software remains a market segment in which U.S. firms should continue to find numerous opportunities. According to many analysts, the IT services market will continue to grow at an average annual rate of 7.4 percent, amounting to \$81 billion in 2005.

Analysts believe the average annual growth rate for IT services will rebound to the 7.4-percent level due to the rising number of e-business-enabled companies, lack of IT-related personnel, and a rising trend among businesses to outsource IT operations to focus on core business objectives.

Looking at the IT services market by area, the outsourcing of IT infrastructure operations/management (IT management services) is projected to be favorable, growing at an average annual rate of 11.4 percent. In addition, the strong demand for CRM-related system and supply chain management related system configurations, including electronic-purchasing/acquisition, from manufacturing, distribution and financial businesses will likely be the driving force of the IT services market. The equipment maintenance segment is expected to remain a slow growth area, due to falling equipment prices and declining shipments. The projected average annual growth rate will remain below 1 percent until 2005.

INTERNET

The number of users in Japan who accessed the Internet from home in March 2002 was 22.76 million, up 46 percent year-on-year.⁹

The number of the people who were able to access the Internet from home was an estimated 51.34 million, up 40 percent year-on-year. The domain which won the greatest number of "unique" visitors (users who access the Internet only from home) was "yahoo.co.jp." Approximately 70 percent of all users who accessed the Internet from home visited this domain at least once during the month of March 2002.

A breakdown of the length of time for using the Internet by users' age showed that children aged between two and 12 spent 4 hours, 9 minutes and 43 seconds on average in March 2002.¹⁰ This is up 58 percent from 2 hours, 38 minutes and 33 seconds a year earlier. The breakdown also showed a 44-percent, year-on-year increase among people aged 50 to 59. These results indicated that the average time for using the Internet increased dramatically among children aged two to 12 and those aged 50 to 59. Previously, there were not many Internet users among these age groups. The results have also shown a year-on-year increase in the average number of domains which Internet users from home visited (10 percent), the Web pages which they viewed (8 percent), and the length of time they spent for using the Internet (13 percent).

As for the domains that won a great number of "unique" visitors (users who access the Internet only from their homes), yahoo.co.jp ranked first, followed by other popular

⁹ Nikkei BP <http://www.asiabiztech.com/>

¹⁰ MPMH PT Report 2001
<http://www.soumu.go.jp/english/index.htm>

portals, such as nifty.com, biglobe.ne.jp, microsoft.com, geocities.co.jp, msn.com, infoseek.co.jp, ocn.ne.jp, msn.co.jp and so-net.ne.jp. Some of them, including yahoo.co.jp, nifty.com, biglobe.ne.jp and msn.co.jp, showed a conspicuous year-on-year growth of more than 50 percent in the number of "unique" visitors. This indicates that these domains are still in the growing stage in terms of the number of visitors.

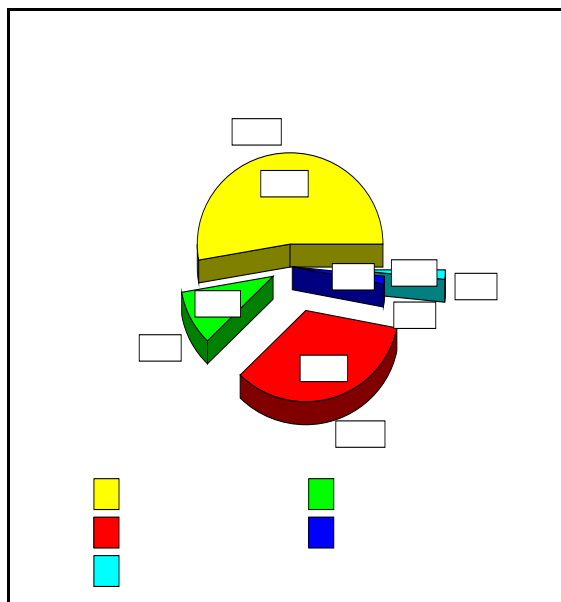
Internet use in Japan is expected to continue to rise. With unbundling of the local loop in 2000, the Internet world was turned upside down in Japan as users could access the Internet at broadband speed for dial-up prices. Broadband subscriber numbers have jumped from 855,000 in 2000 to 6.5 million by 2002. This growth has been driven by ADSL subscribers which represent more than half of the total broadband user base (see Figure 3-3). This trend is expected to change in the future as Fiber to the Home (FTTH) becomes more prevalent and Cable, ADSL and FTTH are all expected to claim a quarter of the total market each by 2006 with the remainder falling to Fixed Wireless Access (FWA) and Fiber to the Building (FTTB).

Internet Use by Sector

According to NetRatings, 57.4 percent of total PC Internet use in Japan is at home, with 34.2 percent at office/school. Internet use at home is expected to continue to grow as more and more households sign up for broadband. Internet use in Japanese schools is still very low compared to other developed countries. This is an area of concern for the

government and one of the elements of the E-Japan Strategy¹¹.

In the private sector, Japanese firms are increasing their use of the Internet, although larger companies are more active than small-to-medium size enterprises. In a recent survey, the Ministry of Public Management, Home Affairs, Post and Telecommunication (MPHPT) found that 90 percent of Japanese firms used the Internet. Most used the Internet for e-mailing customers or intra-firm communication.



¹¹See pg. 50 Chapter 4 for more information

Internet Service Providers

TABLE 3-1

Leading ISP s In Japan:	
"	@Nifty-
"	BIGLOBE-
"	OCN
"	DION
"	ODN
"	So-Net
"	Plala
"	Zero
"	isao.net
"	DoCoMo AOL

Source: US Commercial Service, Japan

The number of ISPs in Japan has been growing by about 400 new ISPs every six months, reaching about 5,500 as of February 2002. Table 3-1 lists the major ISPs in Japan today. This growth is not expected to continue as price competition from broadband providers continues to attract new customers and a consolidation of the market place seems to be taking place.

Fiber Optics/Broadband

The government of Japan (GOJ) considers the deployment of fiber optic cable to be critical to its national IT strategy. The rapidly increasing use of the Internet, the growth of e-commerce and the needs of Japan's global businesses are driving this movement. In addition, the ubiquitous deployment of broadband to homes and businesses is seen as a promising way to mitigate some of Japan's pressing socio-economic problems, including excessive economic and political centralization in Tokyo, congestion of transportation systems in major cities, and a lack of rural consumers' access to goods and services.

The GOJ therefore has made the rapid replacement of copper wire with fiber optic cable a priority with the stated goal of leading the world, including the United States, in broadband by 2005.

As early as 1994, a government advisory council issued a report identifying fiber optic technology as key to Japan's IT infrastructure in the years ahead. At that time, the advisory council predicted that by 2010, with the installation of the necessary infrastructure, Japan's multimedia market could approach \$1 trillion. The council's forecast was broken down into \$540 billion in fiber optic-related goods and services - including video program distribution services, terminal equipment, and networking business - and \$660 billion in conventional, non-fiber-optic-related products.

NTT has been in the forefront of this movement, and is committed to deploying a nationwide fiber-to-the-home (FTTH) network with a target completion date of 2010. In the first stage of development (2000 to 2005), the government's target is to get 40 million households nationwide connected to broadband. This project will require replacing most, if not all, metallic cable in Japan with fiber optic cable. Japan's telecom authorities recognize the massive expenditures required for this undertaking. As a transitional step over the next three to five years, a limited optical fiber access system - from carriers' facilities to local trunk lines - will predominate, mitigating build-out requirements associated with the "last mile" to every home. In the near term, this will allow carriers to connect to individual homes via conventional metallic twisted pair telephone cable, and gradually replace metallic cable with fiber cable as increasing numbers of subscribers request FTTH installation.

While NTT's master plan calls for ubiquitous FTTH by 2010, demand for multimedia services is not likely to take that long to develop. ISPs and Internet users alike are already increasingly unhappy with slow transmission speeds and expensive per-minute line charges. Japan's national and global businesses fear they might fall behind unless they have access to information services comparable to other countries, particularly South Korea and the United States. Which raises another driver of this process--national pride. The GOJ has watched with great trepidation as Japan's traditional rivals, especially South Korea, rapidly deploy fiber for broadband.

To accommodate both national pride and current demand, alternative approaches to completely replacing the copper infrastructure with fiber are underway.¹² DSL is a network technology that can deliver high bandwidth over conventional copper wiring for limited distances. This greatly reduces the need for massive new investments. By using inexpensive DSL technology to widen network bottlenecks, both bandwidth and service charges can be greatly improved.

This transitional phase is now well underway, driven by cut throat competition and declining prices. Consumers in Japan now have several choices for accessing the Internet over wirelines, including Cable TV, DSL, FTTH and Ethernet connections. Subscribers to DSL in Japan, including ADSL, reached nearly 2.4 million at the end of March 2002, according to the MPHPT. At the end of 2000, there were only 9,723 DSL lines in operation. DSL's rapid growth was facilitated by new service providers like Tokyo Metallic and eAccess launching new

services. Participants entering the market in 2001 included Sony and Yahoo! Japan.¹³

The fixed broadband market in Japan has experienced a fierce price war since Yahoo! Japan launched its ADSL service in late 2001 for around \$20 per month. NTT's regional units have already begun to cut monthly subscriptions and offer other sweeteners in response, as well as increasing infrastructure in areas where strong demand is anticipated.

Cable TV (CATV) also provides a vehicle for broadband connection. While cable was slow to develop in Japan, according to Nikkei there were over 10 million Japanese households with cable TV at the end of 2001, representing a penetration rate of 22 percent. In comparison, 70 percent of U.S. households have cable. The cable industry has certain disadvantages, however. It is highly fragmented, with more than 700 service providers, and lacks the economies of scale enjoyed by DSL providers. (Two top providers of CATV - Jupiter Telecom and Titus Communications - recently merged to alleviate this problem.) The future of CATV may hinge on enacting proposed amendments to the existing Cable TV law, which presently does not appear to have a high priority status in the Diet.

According to the U.S. Commercial Service in Tokyo, FTTH service in Japan is intended mainly for households and small and medium sized companies, as FTTH restricts the number of computer terminals that can be connected to the network. NTT, for example, provides several services to users with between five and fifty terminals. For large companies, Ethernet connection or access is available using optical fiber.

¹² NTT, as well as many of its competitors, are opting for various forms of digital subscriber line (DSL) technologies to meet increasing demand for more bandwidth.

¹³ DSL technologies in this report refers to HDSL (High Bit Rate DSL), SD SL (Symmetric DSL), RADSL (Rate Adaptive DSL), ADSL (Asymmetric DSL) and all other variations of DSL.

Dedicated line services for companies are generally more costly vis-à-vis emerging services like Asymmetric DSL (ADSL) and FTTH. In addition, FTTH coverage is currently limited to large city areas NTT made what is now viewed by many observers as a tactical error when it initially opted not to deploy DSL.

NTT chose instead to back Broadband Integrated Services Digital Networks (B-ISDN), which carries digital data, voice, and video over SONET networks.¹⁴

Because of its control of the majority of the local loop, NTT came to dominate the market for ISDN services, accounting for almost 98 percent of ISDN subscriptions.

In its efforts to promote B-ISDN, NTT went so far as to release negative statements about DSL technology (some of which were misleading), and raised impediments to ADSL providers. Consumers soon began to realize, however, that B-ISDN offered slower transmission speeds, and a second line was required in order to use both voice and data. In addition, the MHPPT has been supportive of DSL technologies, in some cases subsidizing remote areas and providing tax incentives. Some in the media also reported favorably on DSL, especially ADSL, as a solution for Internet congestion, and in some cases disparaged B-ISDN. B-ISDN is now widely viewed as on the wane.

Accepting the inevitable, NTT eventually entered the DSL market through acquisition. In 2000, NTT Communications, along with Covad Communications (U.S.), invested in ACCA Networks, a start-up planning to provide DSL services. ACCA Networks began services in urban areas throughout

Japan in 2001. In December 2000, NTT also began offering unlimited Internet access via ADSL in Tokyo and Osaka. Yahoo! Japan's BB service eventually undercut NTT, forcing it to lower its charges, and a price war ensued.

Problems still remain for competitors of NTT looking to lay fiber optic cable, and many companies have complained about obstacles and restrictions that slow their progress. In some cases NTT is viewed as the culprit; in other cases, the MHPPT. Problems range from the issue of unbundling - which involves determining which parts of which cables can be accessed - to the numerous documents required to enter a new area, to what are considered unreasonable regulations governing the physical laying of the cable. An example of regulations viewed as unreasonable is the rule that construction firms cannot work on weekends, must re-pave trenches each day, and must haul in new fill dirt instead of using dirt removed from the trench.

To elaborate, until recently virtually all of the network infrastructure in Japan was legally owned and operated by NTT. Despite pressure on NTT by others in the telecom sector, the company was reluctant to surrender its monopoly of local loop operations or otherwise allow developments which would foster a competitive market environment. When competition was finally permitted, those wishing to lay cable faced the question of how to access NTT's lines. Mounting discontent in the telecom community finally forced NTT to open access to its local loop for those wishing to provide broadband services. However, NTT reportedly continued to refuse to allow access to cable TV providers on the grounds that it was not required to offer "non-telecom" services per Japan's Telecommunications Business Law. While the situation has

¹⁴ Developed by Bell Communications Research Inc., Synchronous Optical Network global transmission standard allows for the multiplexing of a range of signals from asynchronous data and voice, high or low-speed data or voice and on-demand services such as videoconferencing.

reportedly improved, there is still some remaining discontent.

While Japanese consumers have expressed a strong interest in broadband, many are not entirely clear about its benefits. Although this is mainly because applications remain somewhat limited, this is changing. Through its e-Japan initiative, the GOJ is actively trying to educate consumers on broadband applications. Meanwhile, consumer electronics manufacturers are also preparing for the proliferation of broadband to the home. Sony, for example, has announced that most consumer product they make in the future will contain an IPv6-compliant Internet protocol address in preparation for remote operation and control of home appliances. Notably, many electronic product manufacturers have investment stakes in new common carriers (NCCs) providing DSL.

Participants in the Fiber/Broadband Arena

NTT is currently seen as dominating the fiber/broadband arena in all areas including content. NTT Communications' business division offers a wide range of business data services under the brand name of Arcstar. NTT's ADSL access service, "Flet's ADSL", enables users to access the Internet from almost everywhere in Japan via ADSL. NTT Communications has also announced plans to offer DSL services via its investment in start-up ACCA.

There are a myriad of participants competing with NTT for broadband services. KDDI, Japan Telecom, NEC Corp and Masushita Electric recently confirmed plans to offer Internet access services. Other major players include other NCCs and entities owning rights-of-way and physical infrastructure, such as JR (formerly Japan National Railways) and regional electric power companies such as TEPCO. Japan

Telecom uses fiber optic cable set along JR railways, while Teleway Japan uses fiber optic cables set along roads. KDDI is unique in that its trunk lines use microwave transmission.

Other important players include electronics manufacturers such as Kyocera, automobile manufacturers like Toyota, and large trading houses such as Mitsui, Mitsubishi and Sumitomo. In all, more than 121 NCC's are trying to compete with NTT in broadband services, and many may provide business opportunities for U.S. firms when the Japanese market becomes truly competitive.

CHAPTER 4: ELECTRONIC COMMERCE

Electronic commerce (e-commerce) is set to take off in Japan. The Japanese government has committed to develop e-commerce in Japan through the E-Japan policy. Many analysts see e-commerce as the major bright spot in information technologies in Japan in the coming years.

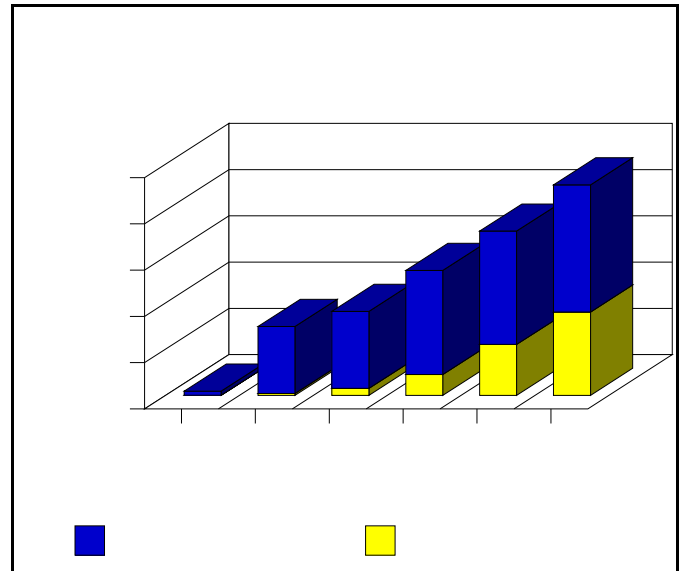
Japan is unique in that 70 percent of Internet users can access the Internet via wireless communications devices. This is expected to change as the Japanese government pushes for wireline broadband access to 80 percent of Japanese households by 2005. Broadband access, via ADSL or cable modem, presently lags behind that of a number of other Asian countries but is currently increasing at a dramatic rate.

The main elements of this plan include development of the world's most advanced Internet network, facilitation of e-commerce, digitization of government, promotion of e-education and ensuring the highest level of network security and reliability in the world.

Total online sales are forecasted to grow to \$115 billion by 2005¹⁵. Companies such as Dell and REI have already been successful in Japan with online sales. Japan has an average household income of \$46,000 versus the U.S. average of \$37,000.

Business to Business Transactions

Opportunities in B2B are growing quickly (see FIGURE 4-1). Most medium- to large-sized Japanese companies are currently looking at B2B as a way to cut costs, reduce inventories, and streamline operations. The continuing overall downturn in the Japanese



economy has provided a market opportunity for enterprise resource management (ERP), customer relationship management (CRM), and supply chain management suppliers. The Japanese B2B market is currently valued at \$363 billion and is expected to increase to \$870 billion by 2005. The B2B market in Japan is dominated by the electronics and automobile industries, which together account for 90 percent of the total B2B market.¹⁶

The Internet brings change to Japanese business practices

The Internet is changing the customary way many large companies do business in Japan. Traditionally, larger firms' elaborate ties with suppliers in groups known as keiretsu, had been exclusive and long-standing. This often resulted in higher prices for finished products, because suppliers were not forced

¹⁵ METI Report 1/31/2001
<http://www.w.meti.go.jp/english/index.html>

¹⁶ METI Report 2002 <http://www.w.meti.go.jp/english/index.html>

to compete among themselves for contracts. Their business was virtually guaranteed. Many Japanese firms realize they must cut costs to remain competitive, and they are being forced to look beyond their keiretsu relationships to do so. Many large firms now use the Internet to find cheaper suppliers. This trend has been opening up some opportunities for foreign suppliers. However, opportunities may come slowly, depending on the industry. Some industry analysts predict that Japanese firms in the auto industry, for example, may continue to procure from traditional suppliers, albeit online.

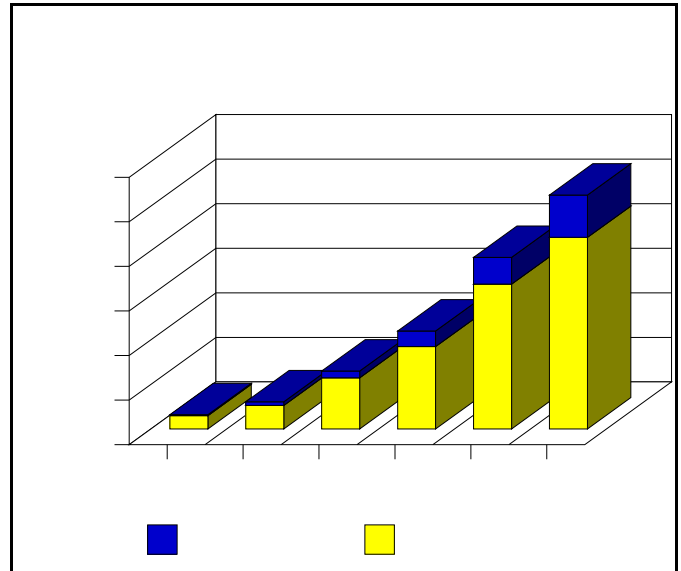
Internet start-ups are emerging

The Japanese workplace is changing in other ways as well. Entrepreneurship has been spurred on by the Internet. Entrepreneurship had been virtually non-existent in Japan, where group cohesiveness is the norm and many workers have sought to work for large firms where they could expect lifetime employment. The Internet is breeding a generation of young entrepreneurs willing to take risks, and who have few ties to traditional Japanese careers. While many of these firms failed when the IT bubble burst, in 2001, many have remained and have carved valuable niches in the Japanese economy.

Business to Consumer Transactions

The value of B2C goods sold online in Japan is estimated to be \$13 billion in 2001 and is expected to grow to \$98 billion by 2005² (see FIGURE 4-2). Most major Japanese retailers have highly developed B2C strategies. Currently, the real estate and automobile industries account for 46 percent of the total B2C market in Japan. Other industry sectors, including travel,

finance, food, gifts and entertainment are expected to narrow the gap in the coming years. B2C e-commerce should grow in tandem with home broadband Internet use.



Internet Access Issues

Japan is home to the second largest Internet user population in the world after the United States, with 55.93 million users¹⁷. The Japanese Internet user base is unique in that more than 70 percent of the users can access the Internet via wireless telecom, primarily through NTT DoCoMo's i-mode service. With the recent unbundling of the local-loop in Japan and the subsequent drop in price in the broadband market, Internet use in the broadband market has taken off, jumping¹⁸ from 855,000 users in 2000 to an expected 22 million users by 2006.

¹⁷ MPH PT 2001 Report on E-Commerce
<http://www.soumu.go.jp/english/index.htm>

¹⁸ MPH PT 2001 Report on E-Commerce
<http://www.soumu.go.jp/english/index.htm>

Hindrances to greater B2C e-commerce

Japanese consumers' apprehension about online purchasing, which in part stems from witnessing security problems occurring in the United States, has been a main issue keeping Japan's B2C e-commerce use low in the past. According to the Japanese government, consumer concerns about online purchasing include protection of personal data, difficulty in returning a purchase or canceling an order, merchandise not appearing the way it was advertised, and untrustworthy vendors.

Another reason is that the concept of credit is relatively new in Japan. Most Japanese prefer to conduct transactions in cash, as opposed to using checks (which are practically nonexistent) or credit cards. This is beginning to change as young consumers are becoming increasingly more comfortable in using credit cards.

One way some Japan-focused B2C sites have addressed these issues is by working with convenience stores, or *konbini*, as a medium. Shoppers make their purchases online, the web site merchant ships the products to the local convenience store, and the consumer picks up their items, paying in cash. Some convenience stores even have created their own e-commerce sites. Many Seven-Eleven locations have installed computers in their stores so that people without computers at home can make online purchases.

B2C sites also have tried to facilitate Web-based payments by introducing the Smartcard or IC card as a payment option on certain web sites. The Smartcard is a small card similar to a credit card that stores information and money on a computer integrated chip. To encourage e-commerce spending, many Smartcards have incentives, such as built-in discounts or the ability to earn more purchasing power by spending a

certain amount of money online. The use of C.O.D., which is quite widespread in Japan, is also popular for concluding online transactions. As mentioned earlier, many consumers prefer to make e-commerce purchases via their mobile phones, because they can receive invoices with their phone bills.

Business to Government

The B2G (business to government sector) is expected to grow rapidly in 2003 and reach \$47 billion by 2006.¹⁹ The growth is largely the result of the Ministry of Land, Infrastructure and Transport (MLIT) completing an electronic bidding system by 2003. Firms will access the system to bid on contracts for most of the public works that are under the Ministry. Other areas for growth in B2G include, electronic and IT related products, including software and services.

Human resources and e-Education

The targets of e-Japan for education are 1) information literacy for all Japanese citizens; strengthening of IT instruction in all levels including adult education; and 3) fostering of IT experts and researchers.

Some of the government sponsored projects include--installation of personal computer equipment, high speed Internet access, and LAN networks at elementary and secondary schools; a new subject known as Period of Integrated Study in elementary school from FY2002 that fosters creative problem solving; a system of training courses/teaching licenses in IT for public school instructors; enhancement of digitalized education content; development

¹⁹ Directorate for Science, Technology and Industry, Committee for Information, Computer and Communications Policy, Paris, 7-8 March 2002, Room Document Number 3, "Information and Communications in Japan," p. 8.

of portal sites for educational institutions and services.

According to a survey conducted by the Ministry of Education, Science and Technology (MEXT) in FY2001, computer literacy is increasing among public school teachers. However, most teachers have not fully integrated the Internet into their lessons, since the personal computers are located in separate labs and not in their classrooms.

E-Commerce Legislation and Regulations

Electronic Signatures

On April 1, 2001, the Law Concerning Electronic Signatures and Certification Services came into effect in Japan. In general, the law implements a voluntary government sponsored accreditation scheme for firms providing electronic signature services that meet certain technical standards. The law states the following requirements for an electronic signature:

--It is a measure that can indicate that the information was created by the person who sent the information;

--It is a measure that confirms whether any alteration of the information has been performed.²⁰

The law makes no distinction between domestic and foreign technologies in its technical standards. In one area, the law has provisions for acknowledging an equivalent accreditation from a foreign government without an onsite inspection by approved investigating organization provided a recognition treaty exists and the standards can be documented. As well, preliminary analysis indicates the law has provisions, which allow for technologies such as

biometrics, passwords and pin numbers. However, the U.S. Government has urged Japan to ensure that its implementation of the law is technology neutral. In addition, the United States has also expressed concern that it is not clear from its reading of the law that other technologies would be considered legally valid in court proceedings.

Draft Privacy Law

Privacy has been a major topic in bilateral discussions between the Japanese and the United States. In the recent U.S. Japan IT Working Group meetings, the United States urged Japan to take a flexible approach to data privacy. This approach would incorporate self-regulation and privacy legislation in highly sensitive areas. The Japanese government drafted a privacy bill that is still in the Diet as of early 2002. The bill will protect personal information for businesses and consumers. Known as the Proposed Law Concerning Protection of Personal Information, the bill refers to electronics databases, but could affect both on-line and offline activities of businesses. The law outlines the rules and responsibilities of companies that deal with personal information.

According to the law, companies must abide by the following broad principles:

--Limitation based on the purpose of usage
purpose of usage needs to be clarified and information needs to be handled with the scope of necessity of the specific usage;

--Fair acquisition;

--Accuracy;

--Safety; and

--Transparency.

The proposed law requires that governmental approval is required for private sector organizations involved in establishing guidelines for the protection of

²⁰ Law Concerning Electronic Signature and Certification, (Unofficial Translation).

personal information and the mediation of disputes.²¹ The United States has urged the Government of Japan to ensure transparency, private sector input and coordination among the ministries during the implementation of any privacy legislation that is ultimately passed.

Internet Service Provider Liability Rules

A new law for Internet Service Provider liability rules was passed in November 2001 and goes into effect in late May 2002. The law in its current form has serious deficiencies which fail to provide adequate protection for the works of right holders and lacks clear-cut liability rules which create significant uncertainty over whether ISP's can be held responsible for illegal activities by users.

The U.S. Government has urged Japan to adopt effective and practical guidelines to implement the law that will balance the interests of Internet service providers, right holders and web site owners. In April 2002, an industry-led working group drafted implementing guidelines and published them for public comment. The U.S. Government and the private sector intend to address our concerns through public comments on the guidelines. The U.S. Government has also urged the Government of Japan to ensure that the industry working group continues to review and if necessary, revise the guidelines after the law goes into effect.

Patent Laws

The Japanese government has announced plans to revise the Patent Law to enhance protection of intellectual property by Internet firms. According to METI, the government will revise patent protections

for computer programs (existing only on the Internet) and trademarks temporarily displayed on computer screens. The current law only prohibits third parties from providing parts and materials to would-be patent violators, and not modules that may facilitate software infringements. The Cabinet is expected to shortly endorse a bill for submission to the Diet. The revisions could be effective six months after passage.

Intellectual Property

Japan has signed both the WIPO Copyright Treaty (WCT) and the Performances and Phonographs Treaty (WPPT). The treaties provide the necessary protection for copyrighted works and sound recordings on-line. So far, Japan has ratified the WCT but not the WPPT. The United States has urged the Japanese to ratify the Treaty without further delay and Japan has submitted legislation to ratify and implement the WPPT to the Diet. The United States expects the Diet to ratify the WPPT by the end of the current session so that our respective music industries are adequately protected in the digital age.

Both U.S. industry and the U.S. Government have been concerned about Japan's reluctance to clearly stipulate that temporary copies are within the scope of reproduction rights. The United States was pleased to learn that Japan has recently recognized the need to protect temporary copies of works and phonograms. This is an important improvement in Japan's protection of copyright and related rights

As in the case of the United States, the Recording Industry Association of Japan is very concerned about the rise of on-line music swapping schemes. According to the Association sales has dropped because of the proliferation of sites offering free songs. Recently, MMO Japan Inc., an operator of an on-line swapping service, marketed

²¹ Proposed Law Concerning the Protection of Personal Information (Translation Provided by Morrison & Forrester LLP, March 27, 2001.

popular software, which would allow users to retrieve songs in Japanese without cost. As a consequence, the Japanese Society for Rights of Authors, Composers and Publishers, and nineteen record companies asked the Tokyo District Court for an injunction against the MMO.²² The Court subsequently ordered MMO to suspend its service concerning MP3 file exchange.

The Japanese music industry is also taking preventing measures against the wholesale of copying of compact disks. By introducing technology with a copy prevention function, the industry wants to prevent the digital recording on hard disks and other devices. These measures are similar to moves underway by the recording and broadcasting industries to protect images and the future digitalization of television images.

Network Security

On November 21, 2001, the United States, Japan and 27 other countries signed the Council of Europe Cyber crime Convention, the first international treaty to address the growing problem of computer related crime. Such crimes include computer related attacks (hacking viruses and denial of service attacks. Under the Convention, the parties must establish laws against cyber crime, ensure that their officials have necessary authority to investigate and prosecute cyber crime offenses, and cooperate with other countries in the fight against computer related crime

Spam

METI is planning to submit a bill that proposes legal revisions to regulate unsolicited e-mail advertisements sent to consumers. The bill addresses mounting complaints over this type of advertisement.

Some of the specific complaints deal with matchmaker and pornographic image providers. According to a private advisory panel to the METI, almost 83 percent of 2,000 consumers surveyed said unsolicited commercial e-mail messages sent to their mobile phones are very annoying, while 51 percent voiced the same opinion of such e-mail messages sent to their personal computers.

METI plans to revise legislation that governs mail-order transactions to cover e-mail messages as well. Implemented in 1976, the original law protects consumers from mail-order businesses. The law allowed unconditional cancellation of contracts and regulated advertisement campaigns. Under the revision, companies sending commercial e-mail messages must note that they are advertisements. Further, companies must include their e-mail address and detail measures to stop advertisements. These revisions follow guidelines of the Organization for Economic Cooperation and Development that were adopted in December 1999.

Regulation of Online Auction Sites

The National Police Agency (NPA) has submitted legislation amending the existing Used Goods Business Act (Kobutsu-Eigyo-Ho) to add certain regulations for online auction service providers. The legislation is concerned with on-line security and tracking stolen goods sold thru the Internet. The legislation will require an on-line auction site operator to get a license from a local police department. The operator will have to provide a name and license number at the top of any Web page listing auction items for sale. The legislation also requires on-line auction sites to verify users and establishes a legal standard for reporting stolen property sold on the Internet. Both

²² <http://www.japantoday.com>, Recording Industry Battles Online Music Trade

the private sector and the United States are concerned that this could lead to over-regulation of the Internet and hinder e-commerce. If the law is passed by the Diet, the United States will urge Japan to draft effective and clear-cut implementing measures through a fully transparent process so that concerns can be addressed by both industry and other interested parties.

Domain Name Registration System

In early 2001, the Japanese Network Information Center (JPNIC) revised the Japanese domain-name registration system. Before the revisions, only one third level domain name per registered company was allowed. Now, multiple second level domain names are permitted. Additionally, the JPNIC ended the practice of prohibiting the transfer of domain names in certain instances. In other areas, the American Chamber of Commerce in Japan (ACCJ) has expressed concern over policy toward domain names, specifically the Japanese version of international standard dispute resolution policy. ACCJ supports a more international standard such as the ICANN uniform dispute resolution policy. ACCJ is also concerned with the JPNIC local presence rule. To participate in the arbitration of disputes, firms must incorporate a separate subsidiary or register a separate branch for each registered domain name.²³

Consumer Protection

In the U.S.-Japan IT Working Group talks, the U.S. Government has urged Japan to promote the development of self-regulatory initiatives for consumer protection and the resolution of consumer disputes, including

alternative dispute resolution (ADR) mechanisms. In its e-Japan Priority Policy Program of 2002, the Japanese Government has indicated that it will support greater utilization of ADR.

ECOM established the experimental "Net Shopping Dispute Counseling" which will continue through the end of March 2003. The MOJ is expanding and revitalizing ADR including the issues of intervention and mediation after the final report of Japan's Judicial Reform Council and reviews of UNCITRAL.

The Japanese private sector has formed partnerships with U.S. and Korean consumer protection organizations. In July 2001, the Japan Information Processing Development Corporation (JIPDEC) and BBBOnLine launched a joint trust mark service. On September 14, 2001, the Japan Direct Marketing Association (JDMA), the Japan Chamber of Commerce and Industry (JCCI), the Korea Institute for Electronic Commerce and BBBOnLine announced an agreement to sign a Memorandum of Understanding, pledging the parties to cooperate in developing:

- Compatible complaint resolution procedures and technologies;
- An international trustmark that would be co-branded with the local organization's own trustmark; and
- International standards for online business practices that each organization's local code would be required to meet or exceed.

On February 27, 2002, the Better Business Bureau and ECOM established a system, which builds on the September 2001 Memorandum of Understanding. Under the system, the BBB will handle Japanese consumer complaints against businesses located in areas served by U.S. and Canadian BBBs, while ECOM will perform similar services for U.S. and Canadian consumers with complaints against

²³ American Chamber of Commerce in Japan, 2001 U.S. Japan Business White Paper, p.145.

merchants located in Japan. ECOM will provide the translation services for the project.

The BBB version of the complaint is located at www.bbb.org web site under the File a Complaint icon. If the complaint involves a business located in Japan, the consumer can access a new form, where basic information is compiled before referral to ECOM. The Japanese ECOM version of the complaint is located at www2.ecom.jp.adr/adfrom1.html.²⁴

Future Trends

Over the last several years, the Japanese government has moved forward with initiatives and reforms to develop and strengthen the legal framework for e-commerce. Many have proved to be successful, gaining the support of the Japanese and international business community. However, the Japanese government has realized the growth of e-commerce has quickly outpaced the enactment of new laws.

For this reason, METI has begun to draft guidelines on e-commerce including measures to protect consumers and prohibit the illegal copying and downloading of music and copyrighted files. These guidelines are the result of meetings and consultations with academics, business leaders, and others in a sub panel under the Industrial Structure Council.

The Japanese private sector continues to make inroads in adapting new technologies for the development of e-commerce. Leading Japanese telecommunication and information technology companies have

begun joint research on a new e-commerce system using high-speed fiber optic networks. NTT, Hitachi and Matsushita Electrical Industrial Co. are working together to produce the next generation network technology. The joint project, known as the Hikari Commerce Systems, will create core protocols to enable interactive connections linking terminals and service systems via optic networks.

As part of the IT Strategy, the Japanese government is planning to develop high-speed Internet networks with East Asia. The networks will establish common e-commerce exchanges in this region. The exchanges will link countries in the region via a satellite network capable of handling huge volumes of data and featuring advanced personal identification systems.

Over 1,000 universities and national research organizations in East Asia will be wired to transmit games and music across the network. Common formats will be set for personal identification and electronic signatures, which are necessary in settling payments. The network will be fully up and running around 2005 when the satellites are launched.

By June 2002, the Japanese government will outline the specifics for the project. At various bilateral and multilateral meetings, the government will actively seek the support of other Asian countries. The government hopes the project will help Japan play a leadership role in the ongoing development of next-generation Net technologies among Asian countries.

²⁴ <http://www.bbbonline.com/about/press/2002/022702.asp>. BBB and ECOM Launch Japan-U.S.-Canada Consumer Complaint System.

CHAPTER 5: SEMICONDUCTOR INDUSTRY

SEMICONDUCTORS

Summary

Japan is the second largest market for semiconductors in the world, followed by the Americas market. U.S. semiconductor firms are a significant presence in the Japanese market. Since the 1990s, the Japanese industry's share of the global market has declined and, in the future, the Japanese market will continue to grow at a relatively slow pace.

Current trends

From 1995 to 1999, the annual growth rate for the Japanese semiconductor market was the lowest in the world. In 2000, sales began to recover as demand surged in the global IT and telecommunications sectors. For 2001, sales declined by one quarter from 2000, which is slightly less than the decline in other markets except Asia-Pacific. By late 2002, sales will assume modest growth when end-user markets begin to recover from the downturn in the IT and telecommunications sectors.²⁵

Japan is the world's second largest market for semiconductor intellectual property including proprietary technology, patents and designs. Forecasts call for continued growth in demand for semiconductor intellectual property in Japan and global market over the next several years. Demand has been growing at a rate above the overall semiconductor market. In 2000, the global

market increased by 40 percent to \$ 690 million.²⁶

U.S. exports of semiconductors to Japan grew from 1996-2000. For 2001, exports fell as the production of consumer and telecommunication equipment declined in Japan.²⁷ However, export figures are not the best standard for measuring prospects for U.S. firms in Japan. The semiconductor value chain is global and diffuse. The industry crosses borders to design, manufacture, package, test and distribute semiconductors. For example, U.S. chips exported and packaged in Malaysia are counted as Malaysian exports when shipped to Japan.

Competitive factors

Japanese firms controlled almost half of the world market for semiconductors in 1991. The share declined to slightly more than one quarter by 2000. Much of the decline can be attributed to Japan's shrinking competitive position as the leader in the dynamic random access memory (DRAM) sector. Throughout the 1990s, the Japanese lost their competitive position when Korean and Taiwanese firms made inroads in the DRAM sector.²⁸ In 2001, the Japanese position further deteriorated following the downturn in the IT sector and collapse of DRAM prices. As a result, firms have begun to exit from the DRAM sector.

²⁶ Asia Pulse News January 21, 2002

²⁷ Compiled from tariff and trade data from the U.S. Department of Commerce, U.S. Department of Treasury and International Trade Commission

²⁸ John Mathews and Dong-Sung Cho, *Tiger Technology: The Creation of a Semiconductor Industry in East Asia* (Cambridge University Press, 2000), pp29-31.

²⁵ Semiconductor Industry Association, "World Semiconductor Forecast 2001-2004" (November 2001).

The shift away from DRAM sector is altering the focus of the Japanese semiconductor industry. In the past, Japanese firms were vertically integrated and served as internal suppliers to huge conglomerates that manufactured everything--consumer electronics, computers, telephones and automotive electronics products. Since the recent downturn, Japanese firms have restructured operations, focused on customized semiconductors, spun-off or outsourced production to EMS (electronics manufacturing service) companies and Taiwanese foundries, and made cutbacks in personnel and capital spending.

Toshiba, Japan's largest manufacturer of semiconductors in terms of sales, has been working the hardest of any Japanese firm to restructure its operations. The parent firm sold off poorly performing businesses, plans to stop manufacturing DRAMs and will shift to segments with less volatile price swings including systems-on-chips, flash memory and diodes.

Some firms are reorganizing operations. NEC regrouped its semiconductor division into seven new technology areas including system memory, custom logic, network systems, network cores, microcomputers, ULSI devices and system ULSI. The firm has started a foundry unit and expanded sale of intellectual property to promote licensing and royalty agreements.

Other firms are forming mergers with competitors. Hitachi Ltd. and Mitsubishi Electric Corp. merged their non-memory businesses into a \$6 billion company that will produce microcontrollers, logic ICs, analog circuits, and discrete devices. Some are hollowing out operations and forming production arrangements with EMS companies.

Since the IT downturn, Japanese firms have made substantial layoffs throughout the electronics and semiconductor production chain, including:

- Hitachi --14,700 employees in 2001;
- Toshiba--18,000 by 2003;
- Matsushita more than 4,000 in 2001;
- Fujitsu 16,400 in 2001;
- NEC 4000 in 2001; and
- Mitsubishi Electric 2,000 for 2001 and 2002.²⁹

Finally, firms are making drastic cutbacks in capital spending. This trend will have a major impact on the future competitiveness of the Japanese semiconductor industry.

Gains for U.S. firms

U.S. firms have advanced in the Japanese semiconductor market as result of cutting-edge technology, increased globalization and government actions. The three U.S.-Japan Semiconductor Agreements represented a major achievement for U.S. trade policy. Since the mid-1990s, U.S. firms captured between 20-30 percent of the Japanese market followed by others (European Union, Taiwan and Korea).

Market access for U.S. semiconductor firms is no longer considered a major bilateral trade problem. The successor to earlier U.S.-Japanese Semiconductor Agreements, the multilateral Joint Statement Concerning Semiconductors by the European Commission, and Governments of the United States, Japan and Korea, does not address market access issues in Japan.

A major feature of the successor Statement is the Government/Authorities Meeting on Semiconductors (GAMS), an annual

²⁹*Electronic Business Asia*, "Sell? Streamline? Spin-off?" (March 2001), p.4.

meeting between the membership of the World Semiconductor Council and their governments. At the meeting, government and industry representatives review recommendations on trade liberalization, regulation, taxation, environment and worker health and safety, standardization, protection of intellectual property and scientific research.

U.S. firms and market entry strategies

Major U.S. firms in Japan include Intel, AMD, Texas Instruments, National Semiconductor, LSI Logic, Harris Semiconductor, International Rectifier, Motorola Semiconductor, Zilog and Micron Technology. Many of the larger firms have established manufacturing facilities or produce semiconductors with Japanese joint venture partners. Some firms sell through distributors while others form strategic alliances with Japanese firms.

Distributors or traders account for between 20-25 percent of the semiconductor consumption in Japan.³⁰ Traders are either affiliated with larger electronics groups or are independents. The first type sources from a wide range of products from a single supplier such as NEC, Hitachi or Mitsubishi. In contrast, the independent trader locates and sign their own contracts with several suppliers including foreign semiconductor manufacturers.

Most traders purchase from suppliers and sell to buyers. However, some perform additional value-added functions. These traders specialize, using computer-assisted tools and software to adapt customized

semiconductors for their customers.³¹ Since the emergence of the e-procurement systems on the Internet, the number of valued-added traders has steadily increased. These systems place more emphasis on establishing direct contact between the manufacturer and end-users, and less emphasis on middlemen such as the distributors of semiconductors.

Associations representing foreign firms are the Japan Electronic Products Importers Association (JEPIA) and Distributors Association of Foreign Semiconductors (DAFS). JEPIA's website is at <http://www.jepia.gr.jp/eindex.html>. The DAF website is at (<http://www.dafs.or.jp/e/prof.html>). JEPIA is an association of electronic products importers. The association introduces foreign products to importers and distributors and participates at exhibits with the Japan External Trade Organization. (See attachment for list of members). DAFS membership is composed of 80 companies that are involved in the import and sale of foreign semiconductors. Other members include Japanese divisions of foreign firms, managers of technical affairs or others who cooperate with domestic users on distribution, logistics and application problems. (See attachment for list of members).

U.S. distributors have not attained success through direct sales and, therefore, some firms are adopting a new strategy. Firms are purchasing shares and leveraging equity in independent traders to reach Japanese customers directly. So far, the firms are gaining a foothold in the market. Moreover, their interest is not exclusively limited to Japan. U.S. distributors want

³⁰ Merrill Lynch, Semiconductor Traders: Trading vs. Technology Gap Business Models, (September 27, 2001), p.5

³¹ Ibid. p2.

business with Japanese customers wherever production occurs whether in Asia or North America. In fact, distributors see Japan as the first step for gaining access to a network of Japanese-controlled foreign factories serving Asian markets.³²

Although Japanese semiconductor firms maintain web sites that include e-procurement, real-time trading on the Internet has not played a major role in their market or industry. However, a unique group of Japanese and U.S. firms have started the first website in Japan, which allows semiconductors to be sold directly through an e-commerce system. Nissho Iwai, in cooperation with eBisTrade, Inc., Compaq Computer Corporation, Microsoft Corporation, UFJ Bank Limited and NTT-X, Inc. established Firsthands. The firm expects link small and medium size manufacturers to end-users of semiconductors. The site is www.firsthands.com

Since the 1990s, greater market openness across national borders has led to increased competitiveness, efficiency and globalization in the semiconductor industry. This trend also has led to an increase in multilateral cooperation on many fronts---technical standards, environmental laws, safety and health regulations, and strategic alliances between global semiconductor firms.

The reasons for strategic alliances are many. The costs and risks of developing new semiconductor products has risen dramatically. Technology is spreading across firms and borders at rapid rates. Research and development has also become more global in scope. Firms respond to these changing industry dynamics by creating networks of alliances with other

semiconductor firms as well as universities, laboratories and other international organizations.

Many alliances have occurred between U.S. and Japanese semiconductor firms. According to the National Research Council, these alliances have taken the following forms:

1. Licensing agreements: legal permission to utilize patents or proprietary technology for an up-front fee or royalties;
2. Cross-licensing agreement: two or more companies give legal permission to use each other's patents;
3. Technology exchange; a swap of proprietary technologies, which may or may not involve a transfer of money;
4. Exchange of researchers to visit, observe, participate and work in research development activities of partner firms;
5. Joint development: two or more companies joining forces to develop products or technology
6. Technology acquisition investments: foreign investments in companies aimed at gaining access to technology, especially in small, start-up or innovative, medium-size firms;
7. Original equipment manufacturing (OEM): manufacturing a product for another company, which applies its label and handles all aspects of business activities, including marketing and servicing;
8. Second sourcing: an arrangement where a company is given permission to manufacture a product designed and developed by another company as a second source of supply for customers using same the specifications.
9. Fabrication agreements: use of another companies fabrication facility to manufacture a product (because the partner

³² Laurie Sullivan, *Electronics Buyer News*, Arrow, other Distributors buy their way into Japan, (June 4, 2001). p.74.

either does not own its own manufacturing facilities or wishes to subcontract out the task of fabrication.);

10. Assembly and Testing Agreements: components and parts manufactured elsewhere are sent to another company where they are assembled and tested;

11. Procurement Agreement: a commitment to purchase certain quantities of specific goods or services over a specific period;

12. Sales agency agreement: exclusive or nonexclusive rights to sell a partners original products or, product which value is added, in specific market;

13. Servicing contracts: the provision of follow-up service in foreign markets (often tied to marketing arrangements;

14. Standards coordination: an agreement on common compatible technical standards, linking devices, systems, and users of different machines.³³

Whatever entry strategy is adopted, the key to success for U.S. semiconductor suppliers in Japan has been sensitivity to customers' needs and market trends, being flexible in design modifications, provision of customized applications and advanced technology, and aggressive marketing including highly competitive pricing.³⁴

U.S. firms also must be committed and persistent. Before entering the market, U.S. firms should conduct lengthy research, do extensive planning and adopt a long-term vision for Japan. Firms must be prepared to meet with their future business partners and customers repeatedly. U.S. firms that are considering operations must also understand many aspects of this market, such as unique

business customs, infrastructures, and cultural and social norms.

Demand in Japanese Semiconductor Market

Demand for semiconductors is based on the rise and fall of electronic system production in the consumer electronics, electronic data (personal computers), industrial, military and aerospace, medical, instrumentation and automotive industries. This chart highlights worldwide electronic system production thru 2002.

Production for electronic systems in Japan will rise by only 1 percent in 2002 after falling by almost 13 percent in 2001, the world's largest decline. Production has been weakened by a slowdown in information technology demand in the United States and a weak market in Japan.

Japanese end-user profile

In Japan, the largest end users of semiconductors are the consumer electronics, personal computer, and telecommunication equipment industries. Japan ranks as the world's largest semiconductor market for the consumer electronics industry, representing almost half of global demand. The consumer electronics industry includes manufacturers of entertainment, radio, television, VCR, personal home appliance, cameras and video games.

Domestically, the consumer electronics industry represents slightly less than one-third of total semiconductor demand. The computer industry represents slightly more than one third and telecommunications equipment is almost one-fifth. However, demand in Japan for semiconductors used in computers and

³³ Hamburg Institute for Economic Research, Kiel Institute for World Economic and the National Research Council, *Conflict and Cooperation in National Competition for High-Technology* (National Academy Press, 1996), p. 63.

³⁴ U.S. Department of Commerce, International Trade Administration, Japan-Semiconductors ISA 990201 Market Research Reports, Industry Sector Analysis

telecommunication equipment is less than in the America s market and European market. In the two regions, these industries play a larger role in creating demand. This chart highlights the end-user segments in the semiconductor industry:

Consumer electronics production is not expected to show signs of recovery within the next year. According to the Ministry of Economics, Trade and Industry, domestic production for consumer electronics will not rebound and experience a decline by 2 percent in 2002.³⁵

The projected decline contrasts sharply with recent trends. In 2000, production rose as demand for DVD video players, digital video cameras and digital still cameras increased worldwide. Domestic production for conventional consumer electronic products such as color televisions and audiovisual equipment, however, continues to decline as manufacturing is relocated offshore.³⁶

Growing Product Segments

Japan represents a third of the world s market for microcontrollers. Key end-users include the consumer electronics, home appliance and automotive industries in Japan. Overall, growth has been steady except for the downturn in 2000. Forecasts call for growth that will return to historical rates by 2003.³⁷

³⁵ http://www.jeita.or.jp/english/stat/electronic/2001/product/pro_10.htm

³⁶ Japanese Electronics and Information Industries Association, *Electronics and Information Technology Industries in Japan*, 2001 edition

³⁷ Semiconductor Industry Association, "World Semiconductor Forecast 2001-2004" (November 2001)

Microcontroller demand will rise as electronic games and home entertainment systems become more widespread in Japan. In addition, interconnectivity for home appliances will bolster demand. Japan s industry is emerging as a leader in the development of interconnected products. Hitachi has formed an alliance with Mitsubishi Electric Industrial to develop these products and related services for air conditioners. This year, Hitachi is also forming a separate unit called Hitachi Home and Life Solutions that will develop networked home appliances and audiovisual equipment.

Another growth area for microcontrollers is the Japanese automotive industry. Already used in engine control, air bags, anti-locking brake systems, in-car entertainment systems and comfort controls; emerging growth applications for microcontrollers include automotive global positioning, anti-collision, and suspension and security systems.³⁸

As a major leader in 3G wireless technologies, Japan is an important market for semiconductors that are used in telephone handsets. U.S. semiconductor technology is being included as a critical component in the new 3G wireless handsets. Texas Instruments is providing processors for handsets for many of the major producers of handsets including NEC, Fujitsu and Panasonic. The technology will support streaming video, Internet video, interactive gaming and instant messaging.

Japan is a significant market for optoelectronics. As of 2000, Japan represented almost 40 percent of the

³⁸ IC Insights Mid Year (July/August) 2001 Update

market. The largest end-users are located in the consumer electronics and computer industries. Although demand fell in 2001, analysts expect the market will rise through 2002. A key driver for demand are emerging optical networks and digital camera markets.

Japan is a growing market for flash memory semiconductors. Although declining in 2001, analysts expect these products will return to previous rates of growth by 2003.

³⁹ Demand will be led by production for cellular phones, digital players and personal computers.

Demand for application specific integrated circuits (ASICS) has grown substantially in Japan. Although growth for ASICS declined in 2001, demand will rise and reach double-digit growth by 2003. Consumer electronics and telecommunication industries in Japan represent the two largest end-user markets.

Demand for systems-on-chip semiconductors (SOC) will rise in 2002. End-users are classified into five categories across different segments: digital consumer electronics, computers /multimedia systems, digital communications, instrumentation, and automotive electronics. Large end-users dominate this segment, and small and medium sized end-users account for less than 30 percent. Portable multimedia applications represent the largest market segment for systems-on-chip semiconductor products in Japan.. ⁴⁰

In the case of automotive electronics, major Japanese manufacturers have technology

centers where they evaluate specific semiconductors for key applications. These manufacturers also design and evaluate customized systems-on-chip semiconductors (as well as standard semiconductors) in cooperation with partners/ suppliers. In addition, subcontracting manufacturers also procure electronic parts including semiconductors; therefore, suppliers must introduce their products both directly to the manufacturers as well as to the subcontractors. ⁴¹

Government and Industry projects

The Japanese government and industry are establishing research and development projects that are designed to achieve breakthroughs in semiconductor technology. The government is funding a seven-year national research project called MIRAI Project (Millennium Research for Advanced Information Technology). MIRAI means "future" in Japanese. The project will focus on developing low-k and high-k dielectrics, and other materials and processes for 0.07-0.05 system chips. The government is investing \$35 million in the project and an additional \$150 million for a state-of-the-art clean room.

Japanese industry is launching the Asuka Project (Advanced Semiconductor through Collaborative Achievement). Asuka will develop fabrication and design technology for System-on-a-Chip semiconductors. As part of the project, eleven major Japanese semiconductor firms including NEC Corporation, Hitachi Ltd. and Mitsubishi Electric Corp. announced the establishment of a joint fabrication facility. The facility will produce semiconductors at a line-width of .10 micron or less. The facility is

³⁹ Semiconductor Industry Association, World Semiconductor Forecast 2001-2004 (November 2001)

⁴⁰ US Department of Commerce, International Trade Administration, Japan - Semiconductors ISA 990201 Market Research Reports: Industry Sector Analysis

⁴¹ US Department of Commerce

targeting system semiconductors with large data processing capacity for use in digital television and communication equipment. Construction is scheduled to begin in mid 2002.

The Japanese semiconductor industry is pioneering a new semiconductor manufacturing strategy that creates a network of small scale minifabs. Less than 10 percent of the size of the conventional wafer facility, minifabs are designed to produce smaller quantities of semiconductors for a wider range of products.

Minifabs will focus on producing non-commodity products including system-on-chips composed of a wide mix of components including DRAMs, SRAMs, flash memory, and logic and analog devices. The semiconductors will be used in the Japanese consumer electronics industry. Firms in this industry will strategically locate the minifabs near their factories to have customized semiconductors made on an as-needed basis. This strategy should strengthen the overall performance of the consumer electronics industry.

The Japanese semiconductor industry has launched the HALCA Project (Highly Agile Line Concept Advancement). This project will develop manufacturing technology for the minifab network. Researchers from the Association of Super-Advanced Electronics Technologies will work together in Tsukuba at the Advanced Semiconductor Research Center of the National Institute of Advanced Industrial Science and Technology, known as AIST. Ten companies are participating in the project, as is Tohoku University. Researchers aim to have practical

manufacturing technologies ready by 2003.⁴¹

Future trends

Although forecasts for 2003 to 2004 are upbeat, the Japanese market will grow at rate slightly less favorable than the other semiconductor regions. Japan is likely to lose several percentage points of market share to other semiconductor producing regions except Europe.

Recovery in the market will largely depend on the health of the Japanese economy, which continues to suffer slow growth. Another key to recovery is renewed electronic systems production in the wireless and computers industries. Expectations are that these sectors will recover in late 2002. Analysts project the global wireless market will increase by more the 200 million units. The personal computer market should also recover from 2001 when it declined by 6.8 percent. Forecasts call for growth to rise by 5.5 percent in 2002.⁴³

Although growth should return, Japanese electronic systems manufacturers are shifting production to lower cost countries especially China. Accordingly, analysts argue that the Japanese semiconductor market will not grow as fast in the future. As they note Historically, wherever electronic system production goes, the semiconductor market will follow.⁴⁴

⁴² John Boyd, Minifabs: A Giant Leap for Japan? *Semiconductor Magazine*, Volume 3 No.3 (March 2002).

⁴³ Electronic Business Asia (January 2002). p26-28.

⁴⁴ IC Insights Mid Year Update (July/August 2001)

Semiconductor Manufacturing Equipment (SME)

Japan is also a large market for semiconductor manufacturing equipment (SME). Japan is the second largest SME market after the U.S. In 2001, the U.S. held 29.1 percent of the world market while Japan held 27.1 percent of the world market.⁴⁵

In 2001, the SME industry experienced the largest single year decline in the history of the industry. According to Semiconductor Equipment and Materials International (SEMI), the worldwide sales of semiconductor production equipment fell 41 percent to \$28 billion in 2001. Japan fared better than other regions with billings declining only 17 percent in 2001 to \$7.6 billion, compared with \$9.2 billion in 2000. Japan started off the first quarter of 2001 strong with a 31.7 percent growth and sales totaling \$3.37 billion compared to \$2.56 billion in the fourth quarter of 2000.⁴⁶ However, Japanese market conditions began to deteriorate significantly the second half of the year with November 2001 shipments falling 69.7 percent from the total for the same month during 2000.⁴⁷ A couple of factors can explain the strong start to 2001. Japan's fiscal year ends March 31, which most likely contributed to the first quarter being stronger for equipment purchases. Also the first quarter of 2001 could have been strong due to the fact that Japanese

chip makers lagged behind other countries in investing during the boom of 1999 and 2000.⁴⁸

Japan is also the second largest supplier of SME to the world next to the U.S. In 2000, 35.7 percent of the total world consumption of SME came from Japanese-based suppliers.⁴⁹

Despite the downturn in 2001, six (6) Japanese SME companies held positions in VLSI's 2001 Top Ten Equipment Suppliers of the Semiconductor Industry. Tokyo Electron Ltd. retained the number two position for the tenth year in a row and Nikon Corporation retained the number three position for the eleventh year. Canon Inc., Dainippon Screen Mfg. Co., and Hitachi-Technologies Corp all jumped three positions to become the sixth, seventh, and ninth largest producers of SME. Advantest suffered the largest decline in sales but still made the list ranking at number ten. Even though these companies made up a majority of the top ten, their combined sales totaled less than 50 percent of the total sales of all ten companies.⁵⁰

Japan's importance to U.S. exporters has been declining in recent years. Historically, Japan has been the largest export market for U.S. firms; however, in recent years it has been eclipsed by faster-growing markets that are more receptive to U.S. equipment. In 1995, Korea briefly

⁴⁵ SEMI Worldwide Semiconductor Equipment Market Statistics Report Shows Global Sales Totaled \$28 Billion in 2001, SEMI Press Room 28 February 2002.

⁴⁶ Chip-equipment Shipments Fall 37.2% in Q2 from Q1 Levels, Says SEMI, Semiconductor Business News 8/24/01.

⁴⁷ Semiconductor Equipment Monitor, Semiconductor International, 3/1/02.

⁴⁸ J. Robert Lineback, Japan Becomes Top Chip Equipment Market in Q1; Taiwan falls to Fifth Place, Semiconductor Business News 23 May 2001.

⁴⁹ Semiconductor Equipment Commerce By Region, VLSI Research 9/01.

⁵⁰ 2001 Top Ten Equipment Suppliers of the Semiconductor Industry, VLSI Research February 4, 2002.

emerged as the top export market, and in 1997, Taiwan assumed that position and has maintained that position through 2001. In 2001, Japan was the second largest market for U.S. exports next to Taiwan with exports to Japan totaling \$830 million.⁵¹ This decline in U.S. exports to Japan is predicted to continue in the coming years. In 2000, U.S.-based SME suppliers held 35 percent of the Japanese SME market. Analysts forecast that by 2006 only 18.8 percent of SME consumed in Japan will come from U.S. suppliers.⁵²

The 2002 forecasts for capital equipment industry growth vary; however, industry analysts agree that the worse of the downturn is over and recovery will begin in 2002. The SME industry should experience double digit growth in 2003.⁵³ The Japanese SME market is expected to recover along with the rest of the world, but it is not expected to grow as much as other regional areas due to low capital expenditure rates by semiconductor producers.

Currently, the SME in Japanese fabs are not being fully utilized. Japanese capacity utilization rates began slowly declining in 2001. In January 2001, capacity utilization were 91.3 percent. By January 2002, capacity utilization had dropped to 57 percent and these rates are expected to decline a few more percentage points through the middle of 2002. Capacity utilization percentages are low across the

board however Japan's are among the lowest.⁵⁴

Furthermore, over the next four years, capital expenditures by Japanese chip makers are forecasted to trail most of the chip-producing regions. In anticipation of continued sluggishness in the market for their products, Japanese semiconductor manufacturers plan to be conservative with spending plans for FY02. Most likely, capital investment in FY02 will stay at similar levels to those seen in FY01. The restraint is designed to ward off the suffering experienced by chip makers as a result of excessive investment in FY00.⁵⁵ In 2001, Japan's capital expenditures to chip sales ratio was lower than the rest of the world and it is predicted it will remain the lowest in the world for the next four years.

As the semiconductor market recovers, chip makers worldwide are expected to increase their capital expenditures in the next few years. For instance, the total capital expenditures for the world for the 2002-2004 period is expected to grow at a compound annual growth rate of 52.5 percent. Most countries, individually, are forecasted to increase their capital expenditures over 50 percent during the 2002-2004 period while Japan is forecasted to spend the least of most of the regional areas at only 46.7 percent. Furthermore, Japan's predicted annual growth rates for capital expenditures during 2002-2004 remains low in comparison to its counterparts.⁵⁶ As a result, industry analyst

⁵¹ U.S. Department of Commerce, U.S. Treasury, and the U.S. International Trade Commission, Semiconductor Manufacturing Equipment-U.S. Exports for Consumption 2001.

⁵² Semiconductor Equipment Commerce By Region, VLSI Research 9/01.

⁵³ 2002 Economic Forecast: CEO Roundup, Semiconductor International 1/1/02.

⁵⁴ Regional Equipment Pulse, VLSI Research March 2002.

⁵⁵ Solid State Technology Semiconductor Weekly, 1/21/02.

⁵⁶ Regional Distribution of Capital Expenditures and Capital Investment Ratios, VLSI Research March 6, 2002.

state Japan will not have enough capacity to increase its share of world chip production due to a reduction in domestic production capacity.⁵⁷

Due to the low capital investment rates by chip makers, industry data forecasts that Japanese SME consumption growth will lag behind the world consumption. In 2002, world consumption is expected to decrease by 5.2 percent. Most of the countries of the world will experience a slight decline; however, Japan's SME consumption will experience the largest decline, with consumption falling by 43.1 percent.⁵⁸ World consumption is expected to grow in 2003 and 2004, but Japan's consumption is not expected to grow as much as other countries.

As Japanese consumption growth lags behind the world growth, it is predicted that Japanese SME producers will mostly supply Japanese consumers, mainly because there are few Japanese SME producers with worldwide capabilities. This will lead to Japanese producers taking a larger share of their own domestic SME market. For instance, in 2000, approximately 60 percent of what Japan consumed came from Japanese suppliers and it is forecasted that by 2006 this figure will reach 75 percent.⁵⁹

300 mm Transition in Japan.

The SME industry has begun a major product transition, moving from equipment based on 200-mm (approximately 8-inch) standard for processing semiconductor

wafers to a 300-mm (approximately 12-inch) standard. The transition from 200-mm to 300-mm equipment will require significant additional investment, but will lead to cost savings and increased production efficiency for the industry because more than twice as many chips can be etched onto a 300-mm silicon wafer than a 200-mm wafer. The current downturn has delayed the transition from equipment based on a 200-mm to a 300-mm standard, in Japan.

Due to delays by semiconductor manufacturers in construction chip-making lines using 300 mm wafers, the 300 mm silicon wafer market in Japan has gone into oversupply. Bulk prices of 300 mm wafers have fallen 10 to 20 percent from a year ago. Despite the recent fall in prices, advanced wafers are still relatively expensive. A 300 mm wafer is 125 percent larger than 200 mm wafer, which is trading at 7,400 to 8,300 yen per unit, compared with the 50,000 to 55,000 yen range of 300 mm counterparts. Furthermore, industry sources predict that manufacturers are unlikely to begin making chips from 300 mm wafers until prices drop to a level 150 percent higher than those of 200 mm wafers.

Currently, Shin-Etsu Handotai Co. and two other Japanese companies are offering 300 mm wafers to chipmakers. Trecenti Technology Inc. and a few other companies have begun making semiconductors from 300 mm wafers. However, the construction of several 300 mm fabs have been delayed due to the current downturn. For instance, Eplida Memory Inc., a joint venture between NEC and Hitachi, will delay introduction of chip making lines based on

⁵⁷ Solid State Technology Semiconductor Weekly, 1/21/02.

⁵⁸ Regional Pulse, VLSI Research March 2002.

⁵⁹ Semiconductor Equipment Commerce By Region, VLSI Research 9/01.

300 mm wafers from December 2001 until September 2002.⁶⁰

Mitsubishi will delay building such lines until FY02, one year later than originally planned. Analysts state that many of the fabs are waiting to see what the economy will do; however, they believe there will be a recovery in 300 mm fab construction by the last quarter of 2002.⁶¹ Currently, worldwide, most 300 mm projects have been delayed.⁶² Industry analysts agree that if implement properly the 300-mm technology will increase chip production and R&D developments in this area will be required to stay in the game.⁶³ Japanese chip makers and SME producers will need to invest in the 300-mm transition in order to be a competitive player in the semiconductor and SME market.

⁶⁰Solid State Technology Semiconductor Weekly 12/10/01.

⁶¹ The Quarterly Spot Report on Semiconductor Fab Projects, Strategic Marketing Associates, Q4 2001.

⁶² Fab Update: Timeline for 300-mm Fabs, Semiconductor International 1/1/02.

⁶³Mokhoff, Nicolas, Chip Equipment Execs Say the Worst is Over, EE Times 3/20/02.

CHAPTER 6: MARKET OPPORTUNITIES AND MARKET ENTRY STRATEGIES

MARKET OPPORTUNITIES

Any honest assessment of Japan's IT market must include the admission that 2002 lies in the wake of a period of boom years. While commercial opportunities clearly still exist for American IT firms, some added effort might be necessary to ferret them out. American companies already active in Japan are aware of the market's recent contraction, and know competition has stiffened. New-to-market companies need to keep in mind certain cautionary tales and hard realities, while pursuing opportunities.

That having been said, most major foreign technology companies serious about the global marketplace eventually enter the Japanese market, recognizing that while it may be a difficult market to penetrate, it is too large and strategically significant to ignore. For the small- and medium-sized exporter, increasing competition presents opportunities as well as challenges. For example, new common carriers (NCCs) now realize the value of using the technology of foreign suppliers to differentiate their services from NTT, and NCCs without R&D facilities rely on foreign vendors for the development of new products.

There are a number of forces favoring a growing IT sector in Japan. Despite the economic downturn, Japanese manufacturing and services firms in all industries understand they must keep pace in IT in order to remain competitive. Nikkei BP reported in 2001 that more than one-third of major Japanese companies still planned to increase their investment in IT this year. Much of this investment was

reportedly directed toward increasing network bandwidth and/or knowledge management software. Nikkei BP said that 42 percent of companies plan to increase network spending, while only 16.8 percent plan to cut it.

In addition, relatively new competition from foreign firms in Japan is having a catalytic effect on the IT sector. For example, Walmart's announcement that it plans to open a store by 2002 is expected to force incumbents in the retailing industry to become more IT-efficient. Given these circumstances, the U.S. Commercial Service in Tokyo reports that U.S. firms have excellent opportunities to sell in Japan provided they have a clear and appropriate operating strategy.

Once a firm makes the decision to enter or expand within Japan's market, questions confronting marketing executives and CEOs include how to find opportunities and, eventually, choose a partner, distributor, or reseller. The U.S. Commercial Service in Tokyo as well as Washington-based trade specialists in the International Trade Administration's Information Technologies Industries stand ready to help U.S. companies address these questions.

With e-commerce set to take off in Japan, there are numerous market opportunities for U.S. e-commerce solutions providers. Japanese firms continue to embrace customer relationship management (CRM), enterprise resource management (ERP) and supply chain management solutions to streamline their business practices. U.S. suppliers are viewed as world class in these

areas and, as a result, enjoy a distinct advantage when entering the market. Japanese industry equates U.S. software with quality and expertise and often seeks out U.S. suppliers. With a growing software sector and increasing e-commerce use across the board, U.S. software and e-commerce solution providers can find many opportunities in the Japanese market. IT services is another area where U.S. firms benefit from the reputation of quality and innovation. Total IT service growth is expected to grow by 10 percent over the next couple of years and US firms are well known for their expertise in this area.

According to the U.S. Commercial Service in Tokyo, the best prospects for telecom equipment sales in Japan include networking equipment such as high-end routers, SOHO routers, in-chassis Layer 3 switches, load balancers, dedicated firewall equipment, bandwidth management equipment, cache servers, SSL accelerators, dedicated VPN equipment, wireless LAN PC cards, building-to-building bridges, VoIP gateways and IP-PBXs.

According to U.S. Commercial Service reports, best sales prospects in wireless equipment are hardware and software that enable telecom carriers to launch new services, including e-commerce services, in the area of mobile Internet. U.S. companies with a unique application technology for mobile phones should consider introducing their service to mobile carriers.

It is difficult to predict the long-term prospects for wireless services. In early 2002, Accenture Corp., along with the Center for Global Communications (GLOCOM), which is affiliated with the International University of Japan, released a report entitled *Four Scenarios for the Japanese Mobile Communication Market in 2010.* Under an optimistic set of

assumptions, in which 3G takes hold and grows along side 2G, the report forecasts that wireless revenue, along with voice/data communications usage fees of mobile devices, will grow from \$46.7 billion in 2001 to be about \$78 billion in 2010.

Under a different set of circumstances, in which the wireless sector is undermined by price wars and/or free service offerings, the report said there could actually be a decline in revenue to about 2 trillion yen. In the latter scenario, the fee-based wireless communications market is undermined by free wireless communications services offered by ISPs run by local authorities or volunteers.

Possible Market Scenarios: Wireline

It remains an open question as to whether Japan's networks will favor or tend to exclude U.S. firms. According to a recent article in *Perspective*, four key questions govern this outcome:

How will land-based broadband integrate with mobile data networks? The United States holds the lead in land-based networks, while Japan has the lead in mobile systems. As the two sectors increasingly merge in the broadband arena, communication architectures in Japan may evolve to resemble DoCoMo's system with short messaging predominating, or a new system that might extend AOL chat-room and instant-messaging technology into a broadband universe.

Who will drive innovation: the users or the providers? An open end-to-end architecture allowed leading-edge users to define the architecture, favoring the United States. In the future, however, providers might drive innovation rather than users, and that could favor Japan.

Will the network of the future rely on open or closed standards?: The Internet employs an open standard, but DoCoMo has demonstrated the possibility of a successful closed standard. Sometimes referred to as a walled garden the i-mode system has been closed in two senses: DoCoMo has used a proprietary technical standard, and controlled the choice of content through its i-mode menu. In 2001 DoCoMo announced plans to loosen control over its technical standards and network content, and publicize the standards for inclusion in the i-mode menu. In so doing, it will set up a third-party organization to certify Internet services not listed on the i-mode menu and to collect fees for these services; and eventually open the i-mode network to Internet service providers.

What will the next-generation network look like? Will it be predominantly a patchwork of private systems on the model of the current Internet, or a more centralized and unified network bringing fiber-optic cable to the home? Once again, the former would provide greater opportunities for the United States.

Possible Market Scenarios: Wireless

Four scenarios proposed by Accenture and GLOCOM for 3G development:

- " *3G will successfully penetrate and 2G will remain as a niche. Existing wireless operators will retain their customers, and the total market scale of all wireless will grow to reach about 9 trillion yen. The existing mobile communication carriers also will lead in 4G.*
- " *2G and 3G will penetrate simultaneously, and competition for leadership will emerge in 4G between the existing 3G mobile communications*

carriers and carriers that provide non-3G wireless communications services. The market scale will grow to about 10 trillion yen.

- " *3G penetration will decline and 2G services will penetrate the market. New carriers will take customers from the 3G sector, and the market scale will shrink to about 4.3 trillion yen. The development of mobile phone devices will stop at the 3G level, and 4G will turn out to be a combination of non-3G wireless communication services and 3G.*
- " *Both 3G and non-3G will become niches because of the penetration of free wireless communications services. The market scale will drastically decline to become about 2.2 trillion, and the market will virtually collapse.*

MARKET ENTRY TIPS

Software/E-Commerce

There are no overt barriers to entering the Japanese IT market. However, some things are important to keep in mind. Localization is key for foreign IT companies of any type to successfully penetrate the Japanese market. The Japanese language has proven to be a barrier to foreign companies because of its complexity, not only in nuance Japanese tends to be extremely polite in comparison to other languages but also in writing style. Also, in a technical sense, it is difficult and expensive to translate software programs into Japanese due to the usage of *kanji*, which requires double-byte programming.

Some form of local representation is essential. Business in Japan is very relationship-oriented and face-to-face

personal interactions are much more important in Japan than in the United States. A local partner will give a U.S. firm a local face and will use personal ties to locate and approach new customers more effectively. Local representation will give small U.S. firms more credibility, help them overcome a lack of brand recognition, and make potential customers more comfortable as well. Establishing a presence in Japan also is important to make it known that one's firm is available to address any potential problems. Even if a U.S. firm cannot have a local presence, it must work closely with its partners to promote sales and provide a high level of user support. One option for local representation is to set up a local sales office. However, for smaller firms just entering the market, there are lower cost options with which to begin. A firm might choose to partner with more established, larger U.S. IT firms, systems integrators, or consultants already doing business in Japan.

Partnering with a Japanese firm, whether large or an Internet start-up, is another potentially successful market entry strategy. However, this strategy can be challenging, and can require a willingness to spend a substantial amount of time and money to find a Japanese partner and build a working relationship.

Market Strategies

The following are excerpts from U.S. Commercial Service *Profile on Strategies for the Japanese Market*. Additional information is available by contracting the Commercial Service, U.S. Embassy, Tokyo Contact: Manabu Inoue, Commercial Specialist
e-mail: manabu.inoue@mail.doc.gov, Tel: 81-3-3224-5062; Rick de Lambert,

Commercial Attaché; e-mail: rick.delambert@mail.doc.gov, Tel: 81-3-3224-5088

- " *Nearly all NCC's are owned by prominent Japanese companies, often telecom equipment vendors. However, many of these vendors may be "NTT family" companies. In reality, NTT family companies at present have little incentive to sell equipment to NCC's as they can get by solely with the huge NTT market. Nevertheless, U.S. firms should work with all possible players to gaining market access in the xDSL area. As long as there is product differentiation, there are always buyers looking for competitive niches.*
- " *U.S. firms interested in strategic alliances with Japanese manufacturers should contact the Communications Industry Association of Japan (CIAJ): most member companies are current or former NTT family companies. A key advantage to working with such firms is that they generally already have excellent personal contacts and good working relationships with NTT and other clients in Japan.*
- " *It is important to note that NCCs always ask for faultless support services and demand extensive relationship building and maintenance between buyers and sellers. Once U.S. firms overcome a potential customer's initially conservative mind-set that U.S. firms' services may be inferior to those of Japanese companies, success is within reach.*
- " *Regrettably, Japanese companies in general often exhibit xenophobia from time to time and NCCs are no exception. One way to overcome this is to establish a "buffer" between a U.S. supplier and a Japanese customer. The buffer could be a*

value-added distributor with technical expertise in telecommunications or a domestic manufacturer with no NTT affiliation. Reasons for not wanting to deal with foreign companies include differences in customs, business practices, and language.

It is critical to establish a physical presence in Japan and to customize and/or localize both products and management. Establishing a presence can be done in many ways: establishing a one-person liaison office in the initial stage, expanding into a branch office, and eventually incorporating in Japan as a stock company or "kabushiki kaisha" ("K.K."). Japanese customers watch foreign companies intensely to determine whether they are patient and committed to establishing long-term relationships.

Extreme care must be made when hiring a country manager to run the Japan office. A common pitfall among U.S. firms is to hire a Japanese who speaks good English, makes an impressive presentation, and impresses top management at corporate headquarters. In many cases, after a couple years the person is found to be less than qualified and has in fact caused considerable damage (such as lost sales forces and/or customers). It is important to look beyond a candidates' "Americanization" and fully consider background, knowledge of the market, and ability to work effectively with potential Japanese customers. A country manager who is capable of effectively switching his mentality back and forth between U.S. and Japanese cultures -- depending on with whom he is dealing -- is most effective. Such people, however, are relatively rare.

CHAPTER 7: THE ROLE OF THE U.S. DEPARTMENT OF COMMERCE

INTERNATIONAL TRADE ADMINISTRATION

The mission of the U.S. Department of Commerce's International Trade Administration (ITA) is to create economic opportunity for U.S. workers and firms by promoting international trade, opening foreign markets, ensuring compliance with trade laws and agreements, and supporting U.S. commercial interests at home and abroad.⁶⁴ The Trade Development (TD) and the U.S. Commercial Service (US&FCS) divisions of ITA are responsible for export promotion. For more information on ITA, visit <http://www.trade.gov>.⁶⁵ For more information on how the U.S. Government assists U.S. businesses export, visit <http://www.export.gov>.⁶⁶

Export.gov Web site

[Export.gov](http://www.export.gov) is a multi-agency trade portal that brings together U.S. Government export-related information under one easy-to-use web site, organized according to the intended needs of exporters, especially small businesses. Whether a company is exploring the possibility of exporting, searching for trade partners, seeking

information on new markets, or dealing with trade problems, this web site can help. Additionally, the site has easy links to information on advocacy, trade events, trade statistics, tariffs and taxes, market research, export documentation, financing export transactions, and much more. For more information, visit the Web site at: <http://www.export.gov>.

TRADE DEVELOPMENT⁶⁷

ITA's Trade Development (TD) unit is the Commerce Department's link to U.S. industry. TD provides industry and market analysis, export promotion services, advocacy for U.S. companies bidding on foreign government contracts, and support for trade negotiations. TD offers an array of services to help small businesses increase their export potential.

Industry Expertise

TD's industry expertise encompasses the majority of U.S. business sectors.⁶⁸ Industry sector specialists provide U.S. firms with: information and analysis of domestic and foreign industry trends; foreign market conditions and opportunities for specific products or services; information on foreign market tariffs and non-tariff barriers and regulations; advocacy assistance; business and cultural practices; and advice on business and cultural practices.

64. Taken from ITA Strategic Plan, Fiscal Years 2002-2006, available at <http://www.trade.gov/ooms/ITAMeasures/ITAStrategicPlan.pdf>.

65. To access updated ITA Work Reference Charts, visit http://www.ita.doc.gov/ita_home/ita_wrc.htm.

66. [Export.gov](http://www.export.gov) is designed to assist U.S. businesses find all U.S. Federal Government export-related information in one, user-friendly Web site. By providing all country, industry, and program information at a central location, [Export.gov](http://www.export.gov) enables users to answer their questions quickly without having to understand the organizational structure of the U.S. Government.

67. More about TD, including information on its services and industry analysts' contact information, is available at <http://www.trade.gov/td>.

68. The agricultural sector falls within the purview of the U.S. Department of Agriculture.

Trade Negotiations and Agreements

TD's industry expertise is the primary source used in trade negotiations by the President of the United States and the Office of the U.S. Trade Representative (USTR). TD's close interaction with industry, understanding of restrictions on market access, product standards and testing requirements, and knowledge of trade data assist negotiators in the drafting of trade agreements with maximum benefits for U.S. firms. Additionally, TD industry experts help monitor and enforce foreign governments' compliance with trade commitments through collaboration with other ITA units, including the US&FCS and Market Access and Compliance (MAC) regional desk officers, as well as the USTR.

TD's INFORMATION TECHNOLOGY INDUSTRIES

TD's Deputy Assistant Secretary for Information Technology Industries oversees the activities of the four (4) high-tech industry-focused offices: Office of Information Technologies (OIT); Office of Telecommunications Technologies (OTT); Office of Electronic Commerce (OEC); and the Office of Microelectronics, Medical Equipment, and Instrumentation (OMMI).

Office of Information Technologies

OIT focuses on the following IT industry segments: computers and peripherals; software; networking equipment; Internet technologies; and e-commerce technologies.

OIT actively supports U.S. IT firms' efforts to expand their business overseas. OIT industry specialists track the growth and competitiveness of domestic and foreign IT industries; counsel U.S. businesses on overseas market conditions and the practical

aspects of exporting their products; identify market barriers as they affect IT exports; and work closely with USTR to negotiate the removal of such barriers.

OIT export promotion activities include trade missions, trade fairs, catalog shows, and technical seminars that introduce U.S. businesses to end-users and potential trading partners located overseas.

OIT staff compile and disseminate detailed information and analyses on the IT industry sectors they cover and contribute to the annual Department of Commerce *U.S. Industry & Trade Outlook* publication that describes current and future IT industry and market trends on a domestic and global basis. These specialists also work to update and expand the OIT Web site with information on foreign markets and regulations, including tariff and tax rates for IT products, U.S. and foreign policies that affect IT exports, upcoming trade events, and additional government and private sector resources. OIT distributes a free electronic newsletter highlighting trade leads, partnering opportunities, and trade events.

To obtain more information, including OIT international trade specialists and the regions/industry sectors they cover, contact:

Office of Information Technologies (OIT)
U.S. Department of Commerce, Room 2806
14th Street & Constitution Avenue, N.W.
Washington, DC 20230
Tel: (202) 482-0571
FAX: (202) 482-0952
Internet: <http://ExportIT.ita.doc.gov>

Office of Telecommunications Technologies

OTT's mission is to support the growth and competitiveness of the U.S. telecommunications equipment and services industries in foreign markets.

OTT provides business counseling to U.S. telecommunications firms seeking to enter or expand in specific markets by developing and disseminating information on the telecommunications market in foreign countries based upon information from US&FCS and a wide range of other industry resources⁶⁹. OTT promotes international trade and investment opportunities for the U.S. telecommunications industry by sponsoring events that offer direct contact with foreign government and industry officials. OTT, in conjunction with sister ITA units and government agencies, acts as an intermediary between U.S. firms and foreign governments to provide advocacy on behalf of U.S. companies bidding on public projects abroad. OTT supports the USTR in trade negotiations to open foreign markets for U.S. telecommunications equipment and services exports. Additionally, OTT monitors both bilateral and multilateral telecommunications agreements and provides input to the USTR regarding compliance by foreign countries. OTT conducts market research and statistical analysis of the domestic and international telecommunications industry and posts a variety of industry information to its Web site. The office distributes complimentary electronic newsletters that deliver up-to-date information on foreign market opportunities and changes affecting the industry and OTT contributes the telecommunications chapters featured in the

Department of Commerce *U.S. Industry & Trade Outlook* publication.

To obtain more information, including OTT international trade specialists and the regions/industry sectors they cover, contact:

Office of Telecommunications Technologies (OTT)

U.S. Department of Commerce, Room 4324
14th Street & Constitution Avenue, N.W.
Washington, DC 20230

Tel: (202) 482-4466

FAX: (202) 482-5834

Internet: <http://telecom.ita.doc.gov>

Office of Electronic Commerce (OEC)

The Office of Electronic Commerce is responsible for expanding U.S. exports by bringing small business exporters into the global economy, as well as engaging U.S. trading partners in e-commerce issues. The focus is to connect U.S. businesses to the new digital economy.

OEC provides information, business counseling, and export assistance services to U.S. firms seeking to enter specific markets by developing and disseminating information on the electronic commerce market conditions in foreign countries. OEC provides general trade and policy analysis and research, including analyzing foreign countries' e-commerce laws and initiatives. IT compared such requirements to U.S. policy requirements as well as other policy developments in relevant international fora.

OEC participates in fostering a favorable policy environment by focusing on keeping both the Internet and foreign markets open to private sector driven global growth. This is accomplished by participating in various fora, such as the U.S. Government's interagency working group on electronic

69. See description of the U.S. & FCS that follows in this chapter.

commerce, the OECD, WTO, European Union, Asia Pacific Economic Cooperation forum (APEC) and Free Trade Agreement of the Americas (FTAA). This effort also includes overseeing the Administration's E-Commerce Joint Statements with other governments, managing the IFAC-4 E-Commerce advisory committee, as well as participating in formal as well as informal policy dialogues with other nations. OEC's task is to determine how to address the changes taking place and ensure that the policy infrastructure is in place to enable business, trade and investment to occur as efficiently as possible in the digital economy. OEC also provides various types of technical assistance, such as video conferences, to bring together government policy and industry experts on various e-commerce issues.

To obtain more information, including OEC international trade specialists and the regions/industry sectors they cover, contact:

Office of E-Commerce (OEC)
U.S. Department of Commerce, Room 2003
14th Street & Constitution Avenue, N.W.
Washington, DC 20230
Tel: (202) 482-0216
FAX: (202) 482-501-2548
Internet: <http://www.ecommerce.gov>

Office of Microelectronics, Medical Equipment, and Instrumentation (OMMI)

OMMI covers electronic components such as electron tubes, printed circuit boards, semiconductors, capacitors, resistors, transformers, and connectors, as well as semiconductor manufacturing equipment. Additionally, OMMI supports several industry sectors with high IT content, including medical and dental equipment and electro medical apparatus, process control

instruments, laboratory analytical instruments, optical instruments, and instruments used to measure electricity and electrical signals.

OMMI's primary mission is to promote exports and increase the international competitiveness of U.S. industry working in these sectors. OMMI counsels U.S. firms on foreign market conditions and the specifics of exporting, using information from overseas US&FCS offices and a wide range of industry-related resources. OMMI staff work with private sector and Department of Commerce colleagues to develop trade missions, trade fairs, catalog shows, seminars, and other trade events that offer direct contact with foreign government officials, industry representatives, and end-users. In cooperation with other parts of ITA and U.S. government agencies, OMMI participates in trade negotiations and supports USTR efforts to eliminate or reduce regulatory and other types of barriers that hinder trade and investment in these industries.

OMMI staff gathers and disseminates market research and statistical analyses of the domestic and international microelectronics, medical equipment and instrumentation industries. Trade and industry reports, trade statistics, information on foreign markets and regulations, U.S. and foreign policies that affect exports, trade events, and links to additional government and private sector resources are available on the OMMI Web site. OMMI industry specialists profile current and future industry and market trends on a domestic and global basis in the Department of Commerce *U.S. Industry & Trade Outlook* publication.

To obtain more information, including OMMI international trade specialists and the regions/industry sectors they cover, contact:

Office of Microelectronics, Medical
Equipment, and Instrumentation (OMMI)
U.S. Department of Commerce, Room 1015
14th Street & Constitution Avenue, N.W.
Washington, DC 20230
Tel: (202) 482-2470
FAX: (202) 482-0975
Internet: <http://www.trade.gov/ommi>

OTHER TRADE DEVELOPMENT OFFICES AND PROGRAMS

Trade Information Center

TD's Trade Information Center (TIC) is an excellent first stop for new-to-export companies seeking export assistance from the federal government. TIC Trade Specialists: 1) advise exporters on how to find and use government programs; 2) guide businesses through the export process; 3) provide country and regional business counseling, foreign import tariff/tax rates and customs procedures, trade opportunities and best prospects for U.S. companies, distribution channels, standards, and common commercial difficulties; 4) provide information on domestic and overseas trade events; and 5) provide sources of public and private sector export financing. TIC trade specialists also assist exporters in accessing reports and statistics from the computerized National Trade Data Bank and direct them to state and local trade organizations that provide export assistance. To contact the TIC, call 1-800-USA-TRADE; FAX (202) 482-4473; e-mail: TIC@ita.doc.gov; or visit the Web site <http://tradeinfo.doc.gov>.

Advocacy Center

The Advocacy Center (AC) aims to ensure that U.S. companies of all sizes are treated

fairly and evaluated on the technical and commercial merits of their proposals for foreign government tenders. Advocacy assistance is wide and varied, but often involves U.S. companies that must deal with foreign governments or government-owned corporations. Assistance can include the visit of a high-ranking U.S. government official to a key foreign official; direct support by U.S. officials (including Commerce and State Department officers) stationed overseas at the U.S. Embassies and Consulates; or, coordinated action by U.S. government agencies to provide maximum assistance. The AC is at the core of the President's National Export Strategy and its goal to ensure opportunities for American companies. Since its creation in 1993, the AC has helped hundreds of U.S. companies in various industry sectors win foreign government contracts valued at more than \$2.5 billion. For more information, visit the AC's Web site: <http://www.trade.gov/advocacy>.

Trade Missions And Events

Working in coordination with the private sector and the US&FCS, TD industry analysts help plan, organize, and execute trade events, including high-level executive missions with the Secretary or Under Secretary of Commerce. Additionally, there are a host of trade conferences and shows held throughout the U.S. and abroad. Industry-specific trade missions and events are listed on the individual TD offices' Web sites⁷⁰.

Small Business Program

ITA's Small Business Program is the focal point for trade policy issues concerning

70. A searchable list of trade events is available through the US&FCS' website at <http://www.usatrade.gov>.

SMEs. The program brings the small business point of view to international trade policy discussions, primarily through the Industry Sector Advisory Committees (ISAC) on Small and Minority Business for Trade Policy Matters (ISAC 14), the only advisory committee to the U.S. Government on small and minority business export concerns⁸. The Small Business Program also provides outreach to and plans events for small, women-owned, and minority-owned firms. Additional information can be found on the Industry Consultations Program's Web site at <http://www.trade.gov/td/icp>, or by contacting the Industry Consultations Program, U.S. Department of Commerce, tel: 202-482-3268; FAX: 202-482-4452; e-mail: Trade_Advisory_Center@ita.doc.gov

Industry Consultations Program

Industry has a voice in U.S. trade policy formulation through the Industry Consultations Program (ICP). The ICP includes more than 500 members and is comprised of seventeen (17) Industry Sector Advisory Committees (ISACs) on Trade Policy Matters and three (3) Industry Functional Committees on Trade Policy Matters (IFACs). The ISACs represent industry sectors of the U.S. economy, including IT and small and minority businesses. The IFACs address crosscutting issues affecting all industry sectors - customs, standards, intellectual property rights, and e-commerce. Advisors on these committees have direct access to trade policymakers at the Department of Commerce and the USTR and help develop their industry's positions on U.S. trade policy and negotiation objectives. Additional information can be found on the ICP's Web site at

<http://www.trade.gov/td/icp>, or by contacting the Industry Consultations Program, U.S. Department of Commerce, tel: 202-482-3268; FAX: 202-482-4452; e-mail: Trade_Advisory_Center@ita.doc.gov.

Export Trading Companies and Trade Intermediaries

The Office of Export Trading Company Affairs (OETCA) promotes the formation and use of export trade intermediaries and the development of long-term joint export ventures by U.S. firms. OETCA administers two programs available to all U.S. exporters. The Export Trade Certificate of Review Program provides antitrust protection to U.S. firms for collaborative export activities. The MyExports.com!" program is designed to help U.S. producers find export partners and locate export companies, freight forwarders, and other service firms that can facilitate export business. For more information, visit <http://www.trade.gov/oetca> and <http://www.myexports.com>.

Market Development Cooperator Program

MDCP is a competitive matching grants program that builds public-private partnerships by providing federal assistance to nonprofit export multipliers such as states, trade associations, chambers of commerce, world trade centers, and small business development centers. These multipliers are particularly effective in reaching and assisting SMEs. Applicants use their own creativity to design projects that will help SMEs to enter, expand, or maintain market share in targeted overseas markets. MDPC awards help underwrite the start-up costs of exciting new export marketing ventures which these groups are often reluctant to undertake without federal government support. For more information, visit <http://www.trade.gov/mdcp>.

71. See Industry Consultations Program section that follows.

THE U.S. COMMERCIAL SERVICE (US&FCS)

The US&FCS, one of TD's sister units in ITA, assists U.S. firms in realizing their export potential by providing: 1) exporting advice; 2) information on overseas markets; 3) assistance in identifying international trading partners; 4) support of trade events; and 5) advocacy, among other services. US&FCS trade specialists work in more than 100 Export Assistance Centers across the United States and in more than 150 overseas posts, in approximately 80 foreign countries, which combined represent more than 96 percent of the world market for exports.

International Operations

Overseas US&FCS offices are housed in U.S. Embassies and Consulates where Commercial Officers serve as intermediaries to foreign markets. US&FCS staff members are industry-focused and offer numerous products and services that assist U.S. companies enter or expand their sales in a particular market. The main activities of these offices include establishing key industry and foreign government contacts, helping match U.S. suppliers with local buyers, and organizing or facilitating trade events. Contact information for US&FCS trade specialists who cover the IT, telecommunications, and e-commerce sectors in Japan is listed in the Appendix of this report.

Domestic Operations

The US&FCS provides export counseling and marketing assistance to the U.S. business community through its 1,800 trade

experts working in more than 100 domestic Export Assistance Centers (USEACs) located across the country. USEAC staff coordinate work closely with their US&FCS colleagues stationed overseas to match U.S. suppliers with foreign buyers. USEACs help firms enter new markets and increase market share by identifying the best markets for their products and services, and developing an effective market entry strategy informed by input generated in the overseas offices. They also advise clients on practical exporting matters such as distribution channels, programs and services, and relevant trade shows and missions, as well as assisting with trade finance programs available through federal, state, and local entities.

US&FCS Services

Market Research

Industry Sector Analysis (ISA)

ISAs are structured market research reports produced on location in leading overseas markets and cover market size and outlook, with competitive and end-user analysis for the selected industry sector. ISAs are available through the U.S. Commercial Service's Web site (<http://www.usatrade.gov>) and are a component of the National Trade Data Bank (NTDB) subscription service detailed below.

International Marketing Insight (IMI)

IMIs are written by overseas and multilateral development bank staff and cover information on the dynamics of a particular industry sector in one foreign market. IMIs are available through the U.S. Commercial Service's Web site (<http://www.usatrade.gov>) and are a component of the NTDB subscription service detailed below.

Country Commercial Guide (CCG)

CCGs are prepared annually by U.S. Embassy staff and contain information on the business and economic situation of foreign countries and the political climate as it affects U.S. business. Each CCG contains the same chapters, covering topics such as marketing U.S. products, foreign trade regulations and standards, investment climate, business travel, and in-country contact information. CCGs are available through the U.S. Commercial Service's Web site (<http://www.usatrade.gov>) and are also a component of the NTDB subscription service noted below.

National Trade Data Bank (NTDB)

The U.S. Commercial Service contributes to the NTDB, a one-stop source of international documents, including market research reports, trade leads and contacts, statistical trade data collected by federal agencies that contains more than 200,000 trade-related information, and Country Commercial Guides. The NTDB subscription may be purchased on CD-ROM, accessed through the Internet (<http://www.stat-usa.gov>), or is accessible free of charge at federal depository libraries. Call 1-800-STAT-USA for more information and ordering instructions.

Export Prospects

Platinum Key Service

The Platinum Key offers customized, long-term assistance to U.S. companies seeking

to enter a new market, win a contract, lower a trade barrier, or resolve complex issues. Fees depend on the scope of work. The U.S. Commercial Service in Tokyo has prepared a customized platinum key program which is highlighted on the following page.

Flexible Market Research (FMR)

FMR provides customized responses to questions and issues related to a client's product or service. Available on a quick turnaround basis, the research addresses overall marketability of the product, key competitors, price of comparable products, customary distribution and promotion practices, trade barriers, potential business partners, and more. Fees vary according to scope of work.

International Partner Search (IPS)

IPS provides a customized search that helps identify well-matched agents, distributors, licensees and strategic alliance partners. A fee of \$600 per country is charged.

Export Promotion

International Buyer Program (IBP)

IBP, supporting 28 major domestic trade exhibitions annually, undertakes for each show a worldwide promotional campaign aimed at maximizing international attendance through work with the overseas network of Commercial Service and Embassy offices. Qualified buyers and prospective distributors, many brought as part of delegations led by overseas commercial staff, are assisted in meeting with interested exhibiting firms and provided services aimed at helping them find new suppliers and trade partners. Each show features an international business center at which export counseling, matchmaking, interpreter and other business services are

provided to international visitors and exhibitors.

Video Conferencing Programs

The "Virtual Matchmaker," "Video Gold Key," and "Video Market Briefing" programs provide an effective tool to help U.S. companies assess an overseas market or overseas business contacts before venturing abroad to close a deal. Companies can use these cost-effective video services to interview international contacts, get a briefing from overseas industry specialists on prospects and opportunities, or develop a customized solution to international business needs.

Gold Key Service

The Gold Key is a custom-tailored service for U.S. firms planning to visit a country. This service provides assistance in developing a sound market strategy, orientation briefings, introductions to pre-screened potential partners, interpreters for meetings, and effective follow-up planning. The fees range from \$150 to \$700 (for the first day) per country.

Matchmaker Trade Delegations

The Matchmaker Trade Delegation Program is designed to match small to medium-sized new-to-market or new-to-export U.S. firms with qualified business contacts abroad. Each mission targets major markets in two or three countries that have strong potential for U.S. goods and services. Delegation members travel to each country and benefit from export counseling, interpreter service and logistics support, market research, in-depth market briefings, and a personalized itinerary of business appointments screened by commercial specialists at U.S. Embassies and Consulates.

BuyUSA.com

BuyUSA.com (<http://www.buyusa.com>) is a unique public/private partnership between the U.S. Commercial Service and IBM. It established a one-stop international marketplace for U.S. small to medium-sized enterprises to identify potential international partners and transact business on-line. The BuyUSA.com e-marketplace includes managed/targeted trade leads, on-line catalogs, automated searching and sourcing, financing, logistics, currency conversion, due diligence, landed-cost calculation, and tariff and duty calculation. BuyUSA.com is the only Web site of its kind to combine an on-line interface with a worldwide network of one-on-one trade counselors.

Product Literature Centers

This program showcases U.S. company product literature through exhibits in international trade shows held in both mature and emerging markets. The Product Literature Center is a low cost, efficient way for small and medium-sized firms to get worldwide sales leads in their particular industry. A Commerce Department industry/international specialist or the U.S. Embassy operates Product Literature Centers. Visitors to Product Literature Centers are required to register and may take company literature with them. All sales leads are sent directly to the Product Literature Center participant.

Multi-State Catalog Exhibitions Program

This program showcases U.S. company product literature in fast-growing markets within a geographic region. The U.S. Department of Commerce and representatives from state development

agencies present product literature to hundreds of interested business prospects abroad and send the trade leads directly to U.S. participants.

Commercial News USA (CNUSA)

CNUSA, a catalog-magazine containing advertisements of U.S. products, is published 12 times per year by the Commercial Service through its private-sector partner, ABP International, to promote U.S. products and services to more than 400,000 potential buyers and partners in 145 countries.

Useful Contacts in the United States and Japan

United States

U.S. Department of Commerce,
International Trade Administration
Trade Development

*Office of Telecommunications Technologies
(OTT)*

Linda Astor
U.S. Department of Commerce
14th Street & Constitution Avenue, N.W.,
Room 2807
Washington D.C. 20230
Phone: (202) 482-4466
Fax: (202) 482-0952

Office of Information Technologies (OIT)

R. Clay Woods
Director, Software Division
U.S. Department of Commerce
14th Street & Constitution Avenue, N.W.,
Room 2807
Washington D.C. 20230
Phone: (202) 482-0569
Fax: (202) 482-0952
E-mail: clay_woods@ita.doc.gov

James Golsen
International Trade Specialist - Japan
U.S. Department of Commerce
14th Street & Constitution Avenue, N.W.,
Room 2807
Washington D.C. 20230
Phone: (202) 482-0551
Fax: (202) 482-0952
E-mail: james_golsen@ita.doc.gov

Trade Associations

American Electronics Association (AEA)
William T. Archey
President
1225 Eye Street, NW
Suite 950
Washington, DC 20005
Tel: 202-682-9110
Fax: 202-682-9111
Email: Bill_Archey@aeonet.org
Web address: <http://www.aeonet.org>

Business Software Alliance (BSA)
Robert Holleyman, II
President
1150 18th Street
Suite 700
Washington, DC 20036
Tel: 202-872-5500
Fax: 202-872-5501
Email: software@bsa.org
Web address: <http://www.bsa.org>

Computer & Communications Industry
Association (CCIA)
Ed Black
President
666 11th Street, NW
Suite 600
Washington, DC 20001
Tel: 202-783-0070
Fax: 202-783-0534
Email: ccia@aol.com
Web address: <http://www.ccianet.org>

*Information Technology Association of
America*
Harris Miller
President
1616 North Fort Myer Drive, Suite 1300
Arlington, VA 22209
Tel: 703-522-5055

Fax: 703-525-2279
Email: ccayo@itaa.org
Web address: <http://www.itaa.org>

Information Technology Industry Council

Rhett B. Dawson
President
1250 Eye Street, NW
Suite 200
Washington, DC 20005
Tel: 202-737-8888
Fax: 202-638-4922
Email: rdawson@itic.nw.dc.us
Web address: <http://www.itic.org>

Software and Information Industry Association

Kenneth Wasch
President
1730 M. Street, NW
Suite 700
Washington, DC 20036
Tel: 202-452-1600
Fax: 202-223-8756
Email: kwasch@spa.org
Web address: <http://www.siia.net>

Telecommunications Industry Association (TIA)

Jason Leuck
Director, International Affairs
1300 Pennsylvania Avenue, NW, Suite 350
Washington, DC 20004
Tel: 202-383-1493
Fax: 202-383-1495
E-mail: jleuck@tia.eia.org
Web address: <http://www.tiaonline.org>

Cellular Telecommunications & Internet Association (CTIA)

Thomas Wheeler
President and CEO
1250 Connecticut Avenue, NW, Suite 800
Washington, DC 20036
Tel: 202-785-0081

Fax: 202-785-0721 or 202-467-6990
Contact: Robert Roche, Research Director;
Jeffrey Nelson, Communications Director
Web address: <http://www.wow-com.com>

Personal Communications Industry Association (PCIA)

Jay Kitchen
President
500 Montgomery Street, Suite 700
Alexandria, VA 22314-1561
Tel: 703-739-0300
Fax: 703-836-1608
Contact: Mark Golden
Web address: <http://www.pcia.com>

Satellite Industry Association (SIA)

Richard DalBello
Executive Director
225 Reinekers Lane, Suite 600
Alexandria, VA 22314
Tel: 703-549-8697
Fax: 703-549-9188
E-mail: info@sia.org
Web address: <http://www.sia.org>

United States Telecom Association (USTA)

Walter B. McCormick, Jr.
President & CEO
1401 H Street, NW, Suite 600
Washington, DC 20005-2164
Tel: 202-326-7300
Fax: 202-326-7333
Contact: Kathleen Kelleher
Tel.: 202-326-7357
E-mail: kkellehe@usta.org
Web address: <http://www.usta.org>

U.S. GOVERNMENT

U.S. Commercial Service Tokyo
Email: Tokyo.Office.Box@mail.doc.gov
Address: American Embassy
U.S. Commercial Service
1-10-5 Akasaka, Minato-ku
Tokyo 107-8420

Phone: 81-3-3224-5060

Fax: 81-3-3589-4235

American Embassy

U.S. Commercial Service

Unit 45004, Box 204

APO AP 96337-5004

Steve Knode

Commercial Officer

Phone: 81-3-3224-5066

Fax: 81-3-3589-4235

Email: steve.knode@mail.doc.gov

JAPANESE INDUSTRY

Trade Associations

*Japan Information Technology Services
Industry Association*

17th Fl, Time 24 Building

2-45 Aomi, Koto-KU

Tokyo 135-8073 Jpn

Tel: 81-3-5500-2610

<http://www.jisa.or.jp>

*Semiconductor Industry Association (Japan
office)*

Asia Office Level 14

Hibiya Central Building

1-2-9 Nishi-Shimbashi,

Minato-ku Tokyo, 105-0003

Tel: 81-3-5532-7264

<http://www.siaj.org>

*Optoelectronic Industry and Technology
Development Association*

Sumitomo Edogawabashiekimae Bldg. 7F,
20-10,

Sekiguchi 1-Chome, Bunkyo-ku, Tokyo
112-0014

Tel: +81 3 5225-6431

Fax: +81 3 5225-6435

Web site: <http://www.oitda.or.jp/>

Japan Electronics and Information

Technology Industries Association (JEITA)

11, Kanda-Surugadai 3-chome, Chiyoda-ku,

Tokyo 101-0062, Japan

Mitsui-Sumitomo Kaijo Surugadai Bldg

Annex

Tel: 03-3518-6408

Fax: 03-3295-8729

Web site: www.jeita.go.jp

Japan Electronics Show Association

5F, Sumitomo Shiba-daimon Building No.2,
12-16,

Shiba-daimon 1-chome, Minato-ku,

Tokyo 105-0012, Japan

e-mail: info@jesa.or.jp

Companies

Sony Corporation

International Semiconductor Procurement
Center

7-35, Kitashinagawa 6-chome

Shinagawa-ku, Tokyo 141, Japan

Tel: 03-5448-3925

Fax: 03-5448-7816

NEC Corporation

International Purchasing Div.

7-1, Shiba 5-chome, Minato-ku,

Tokyo 108-01, Japan

Tel: 03-3798-9257

Fax: 03-3798-9256

NEC Corporation Procurement Site

Web site:

http://www.procurement.nec.co.jp/index_e.html

Fujitsu Limited

Electronic Devices Business Administration
&

Operations Group Administration Div.

Purchasing Dept.

1015 Kamikodanaka, Nakahara-ku
Kawasaki-shi,
Kanagawa 211, Japan
Tel.: 044-754-2233
Fax: 044-754-2757

Toyo Electric Mfg Co., Ltd.
Sagami Works
Purchasing Sect.I
6-32, Higashi-Kashiwagaya 4-chome
Ebina-shi, Kanagawa 243-04 Japan
Tel.: 0462-31-4113
Fax: 0462-31-4118

OMRON Corporation
Manufacturing Administration Center,
Manufacturing and Purchasing Group,
Kyoto H.Q. Ltd
Karasuma Nanajo, Shimogyo-ku, Kyoto
600, Japan
Tel.: 075-344-7150
Fax: 075-344-7151

Toshiba Corporation
Procurement Div. Procurement Center
1-1, Shibaura 1-chome Minato-ku,
Tokyo 105-01, Japan
Tel: 03-3457-2453
Fax: 03-3456-6619

Toshiba Procurement website
<http://www.Toshiba.co.jp/procure/contact/index2.html>

Hitachi International Procurement Dept 6
Kanda-Surugadai 4-chome
Chiyoda-ku, Tokyo 101, Japan
Tel: 03-3258-1111
Fax: 03-3258-5497

Hitachi Ltd. Procurement website
<http://global.Hitachi.com>

Mitsubishi Electric Corporation
International Purchasing Center Purchasing
Dept, 2-3, Marunouchi 2-chome
Chiyaka-ku, Tokyo 100, Japan
Tel: 03-3218-2365
Fax: 03-3218-2384

Distributors

Distributors Association of Foreign Semiconductors (DAFS)
Shin-Yoyogi Bldg., 1-19-12,
Yoyogi, Shibuya-ku, Tokyo 151-0053
Tel: 03-5350-6860
Fax: 03-5350-6828
<http://www.dafs.or.jp/e/member/n.html>

DAFS Membership
Adm K.K..Shin Seifu Bldg., 1-2-19,
Nakatsu, Kita-ku,
Osaka 531-0071
Tel. 06-371-6801
Fax. 06-371-5505

Ado Electronic Industrial Co.
2-18-10, Sotokanda,
Chiyoda-ku, Tokyo 101-8991
Tel: 03-3257-2600
Fax: 03-3251-6796

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